Financing Sustainable Water

FINANCING SUSTAINABLE WATER
Rates. Revenue. Resources.

Alliance for Water Efficiency

Agenda

8:30 am – *Registration and Networking Breakfast*
9:00 am – Welcome—Colorado Water Conservation Board
9:15 am – Strategies for Aligning Rates, Revenue and Resources
10:00 am – Colorado's Water Plan: Meeting Statewide Efficiency Goals from the Bottom Up
10:15 am – *Break*
10:30 am – Effective Rate Modeling in an Uncertain World
11:45 am – *Lunch and Networking*
12:30 pm – Water Provider Perspectives: Balancing Stakeholder Interests
1:15 pm – Councilmember Perspective: How to Get to Yes on Rates
2:00 pm – *Break*
2:15 pm – Real Rate Solutions in Colorado and Beyond
2:45 pm – Live Model Training (Optional)
3:15 pm – Adjourn

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LAKEWOOD, CO MARCH 2, 2017

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Thank You to our Partners and Sponsors

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COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Alliance for Water Efficiency

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econics

American Water Works Association
Rocky Mountain Section

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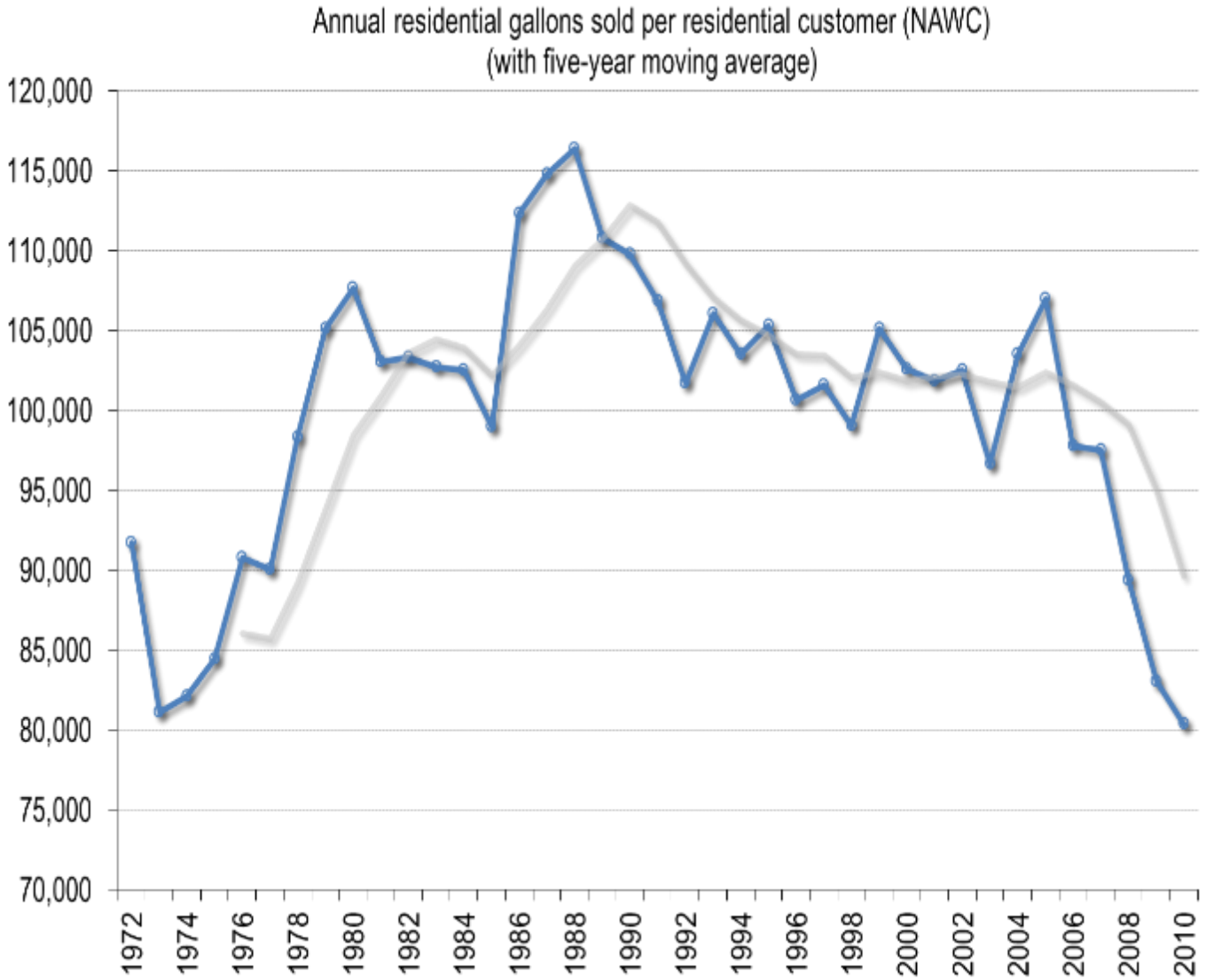
Utility Financial Management: Becoming Harder Than Ever?

Residential Water Sales



Isn't this a Success Story?

- *Yes, but with side effects*
- Lowered demand means reduced sales revenue
- Reduced sales revenue can mean not fully collecting fixed costs
  - Short-run variable costs (water, pumping energy, chemicals)
  - Long-run capacity costs (supply, transmission, storage, treatment)
- Revenue stability therefore becomes an issue – *and conservation is often blamed*
- Left untreated, long-term unstable revenue collection can affect bond ratings

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U.S. | THE TEXAS TRIBUNE

Texans Answer Call to Save Water, Only to Face Higher Rates

By NEENA SATIJA FEB. 8, 2014

"The losses have prompted credit ratings agencies to look closer at the finances of public utilities in Texas. One agency, Fitch, downgraded some of Fort Worth's water and sewer debt last year, and last week the firm downgraded the debt of the city's wholesale water supplier. Fort Worth lost $11 million last year because of water conservation."

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What Really Affects Revenue Stability?

- Reduced demand from:
  - efficient fixture replacement under the plumbing and appliance codes
  - active conservation programs
  - the recession: industrial shift layoffs, home foreclosures
- Reduced peak demand in wet years
- Increased infrastructure costs
- Rise in other fixed costs
- Continuing Inflation

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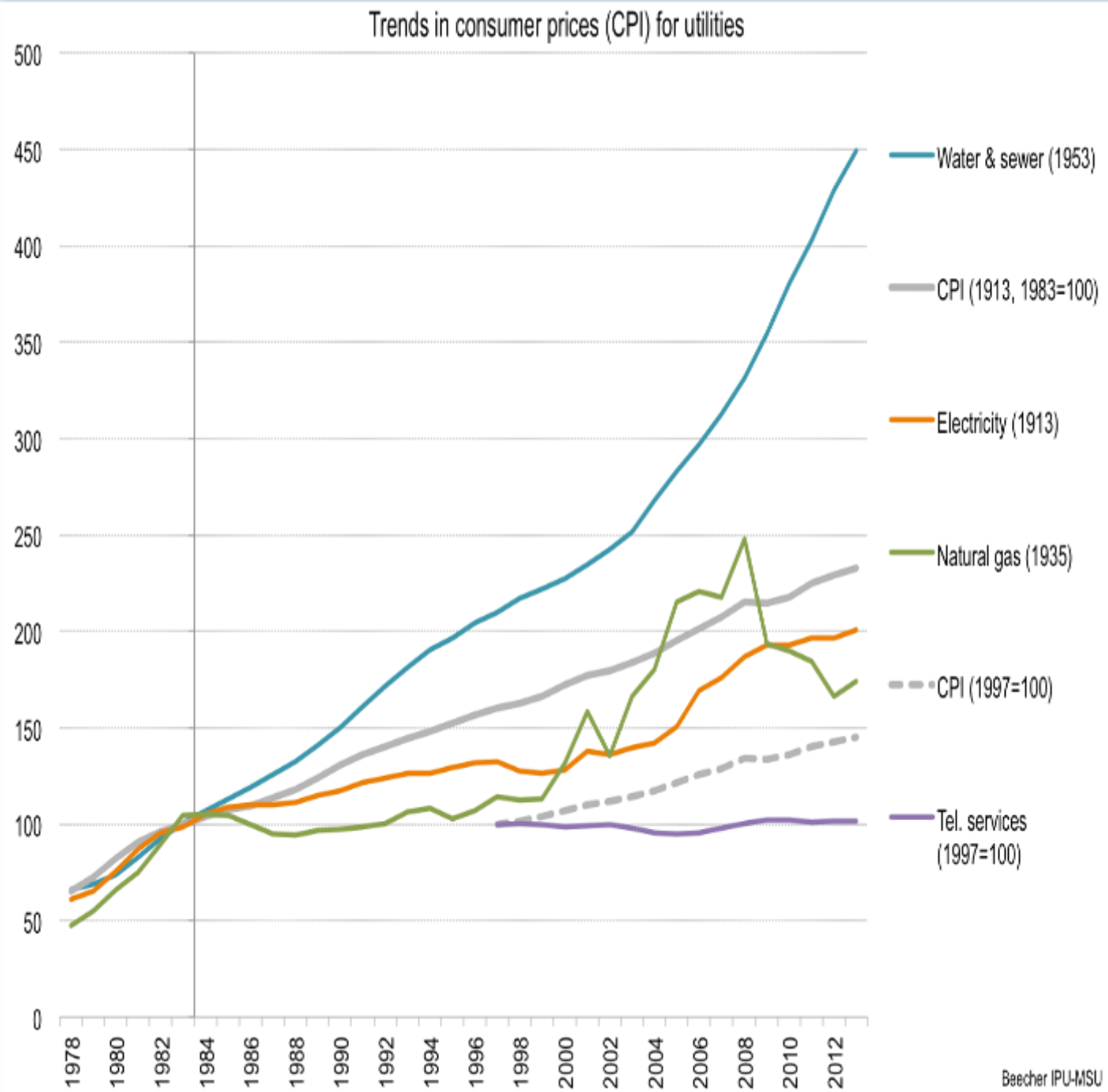
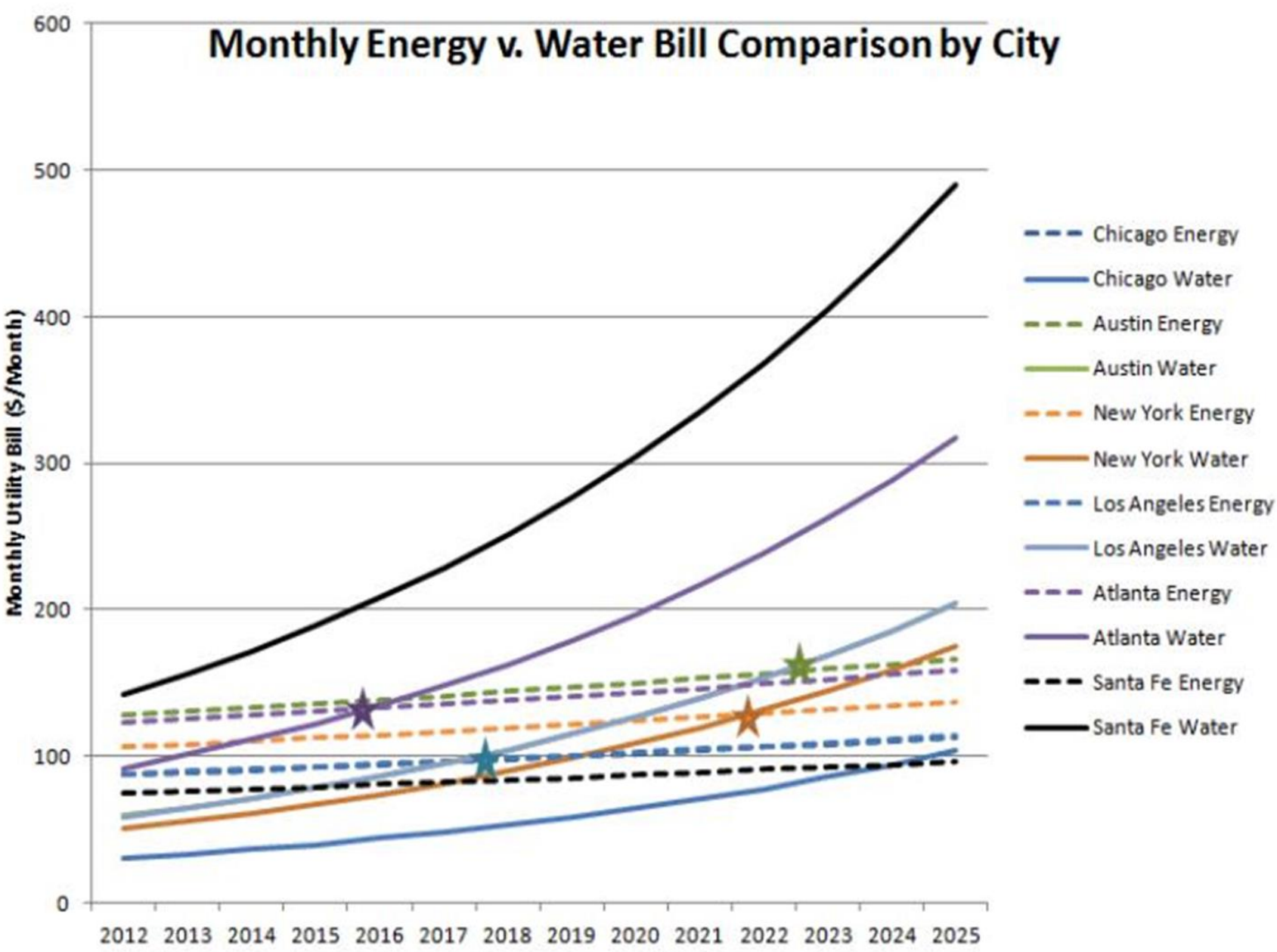

Trends in consumer prices (CPI) for utilities
500
450
400
350
300
250
200
150
100
50
0
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Water & sewer (1953)
CPI (1913, 1983=100)
Electricity (1913)
Natural gas (1935)
CPI (1997=100)
Tel. services (1997=100)
Beecher IPU-MSU


Monthly Energy v. Water Bill Comparison by City
Monthly Utility Bill ($/Month)
600
500
400
300
200
100
0
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Chicago Energy
Chicago Water
Austin Energy
Austin Water
New York Energy
New York Water
Los Angeles Energy
Los Angeles Water
Atlanta Energy
Atlanta Water
Santa Fe Energy
Santa Fe Water

Cost-Effective Efficiency and the Real Impact on Rates

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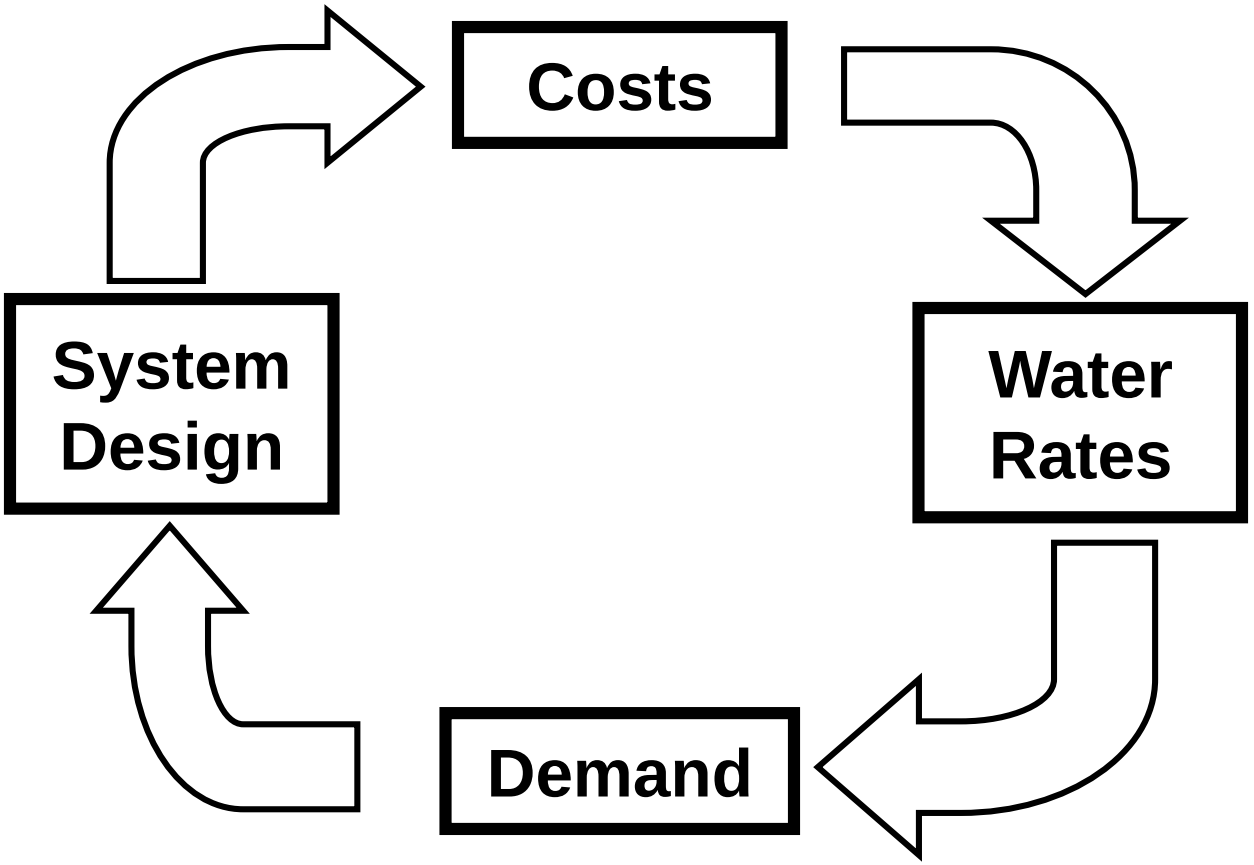
Water Flow and Flow of Economic Logic



Conservation is Part of the Solution

- It is a long-term cost reducer to the utility
- Revenue loss is often due to other drivers
- Every gallon saved is water that does not have to be pumped, treated and delivered
- Conservation is an investment and short-term effects must be planned for
- Reduced utility costs generally mean reduced customer rates in the long-term due to avoided infrastructure capacity increases

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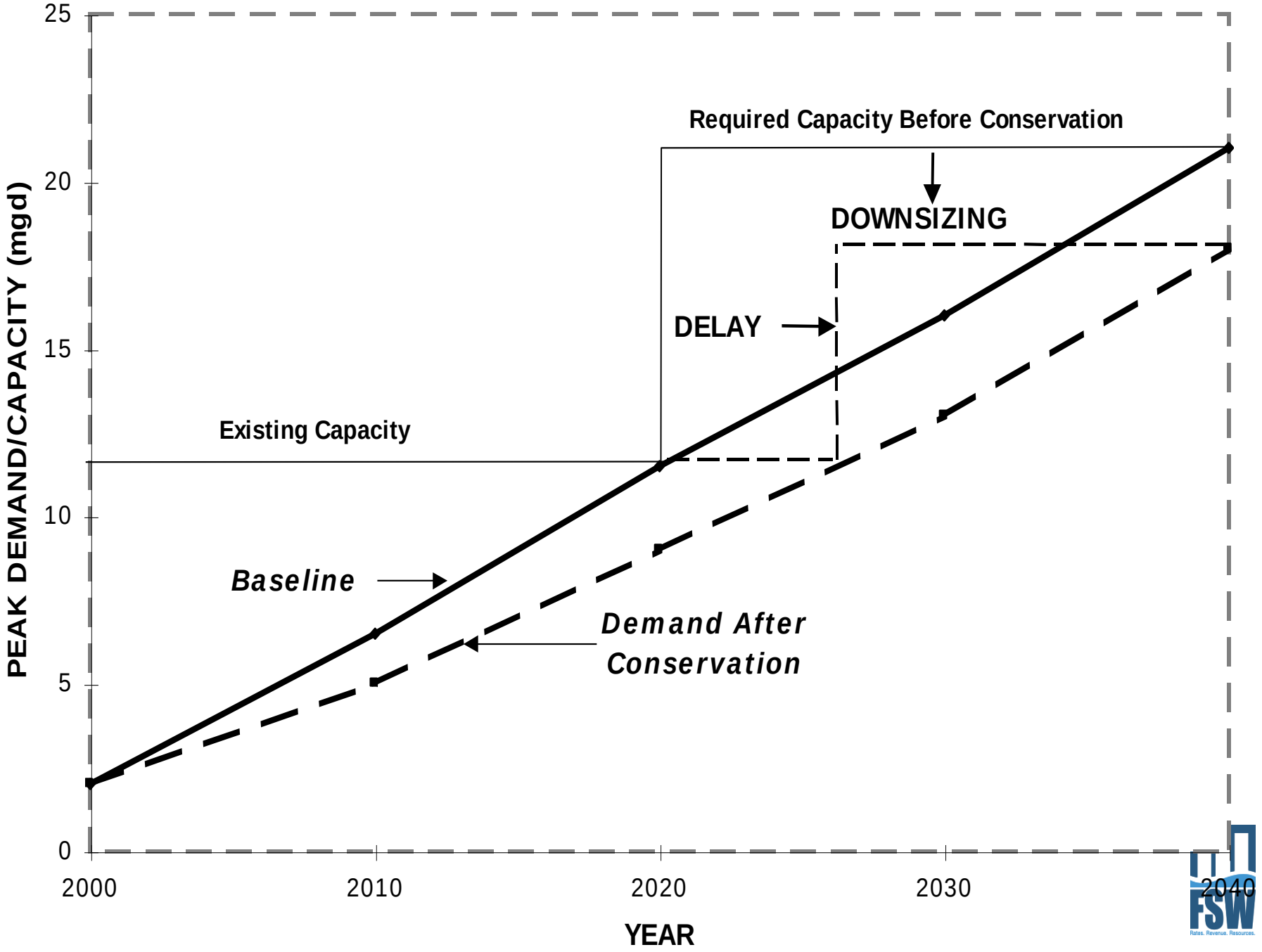
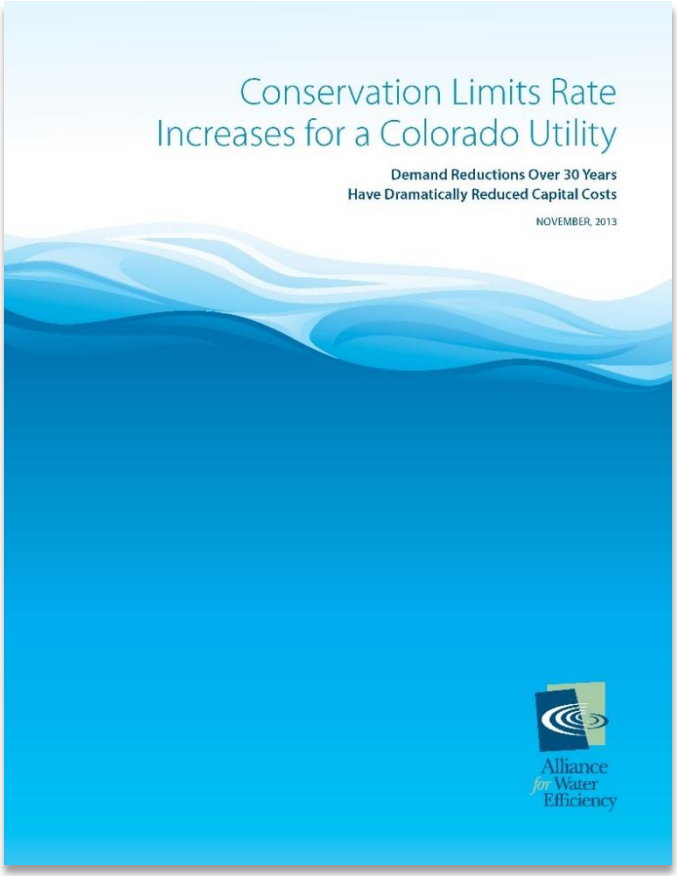

25
20
15
10
5
0
PEAK DEMAND/CAPACITY (mgd)
Required Capacity Before Conservation
DOWNSIZING
DELAY
Existing Capacity
Baseline
Demand After Conservation
2000
2010
2020
2030
2040
YEAR

Westminster's Story

- Citizens complained about being asked to conserve when rates would just go up anyway
- Westminster reviewed marginal costs for future infrastructure if conservation had not been done
- Since 1980 conservation has saved residents and businesses 80% in tap fees and 91% in rates compared to what they would have been without conservation



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More Stories like Westminster

- AWE is working with two more cities in reviewing marginal costs for future infrastructure if conservation had not been done
- In one city, preliminary results show a single-family customer pays 22.2% less today
- In the second city, preliminary results show that customers pay 178% less in tap fees and 6% less for water and sewer rates

What Will Your Story Be?

- Every story will be different!
- Consider key questions to determine the case for efficiency
- Where do costs come from and what are your future cost risks?
  - Wholesale water costs may be increasing
  - Costs of capital improvements
  - Short run variable costs (treatment, energy, etc.)
- What's your return on the investment in efficiency?
- How do you quantify it?
- AWE Tracking Tool provides forward-looking analysis

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FSW: Key Concepts

- Revenue instability is a feature of ALL rate structures
- Efficiency objectives should be identified at the start
- One size does not fit all
- Embracing uncertainty enables better decision-making
- Better rate analysis requires good data
- Customer understanding and empowerment is key
- Sound financial policies can support fiscal sustainability

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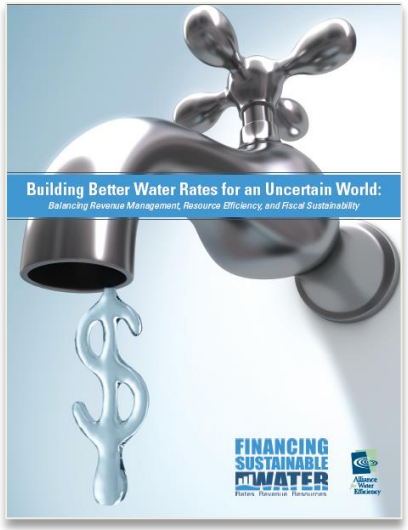
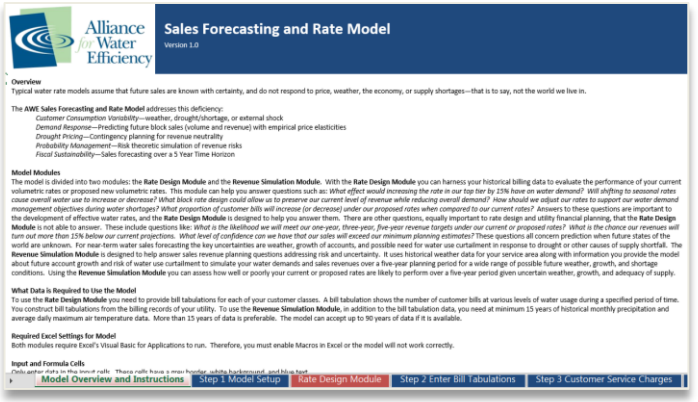
What is Financing Sustainable Water?

- **Building Better Rates in an Uncertain World:** A Handbook to explain key concepts, provide case studies and implementation advice
- **AWE Sales Forecasting and Rate Model:** Innovative, user-friendly tool to model scenarios, solve for flaws, and incorporate uncertainty into rate making
- **FinancingSustainableWater.org:** Web-based resources to convene the latest research and information in one location





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The Heart of the Problem

- Water rates have traditionally been focused solely on historical cost-recovery
- When system costs change quickly, and perhaps unpredictably, historical rates do not reflect today's cost consequences
- Rates do not then give customers correct information to make consumptive decisions

An Alliance for Water Efficiency Handbook

Building Better Water Rates for an Uncertain World

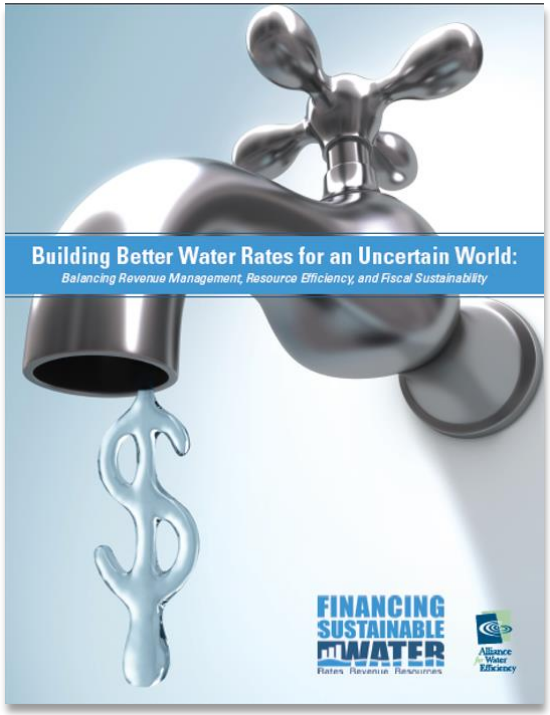
Balancing Revenue Management, Resource Efficiency, And Fiscal Sustainability

Thomas Chesnutt, A&N Technical Services

SECTION I: Introduction
SECTION II: Today's Imperative for Utility Financial Management
SECTION III: The Role of Ratemaking
SECTION IV: Building a Better (Efficiency-Oriented) Rate Structure
SECTION V: Financial Policies & Planning for Improved Fiscal Health
SECTION VI: Implementing an Efficiency-Oriented Rate Structure

Appendices

- Appendix A – Costing Methods
- Appendix B – Demand and Revenue Modeling
- Appendix C – AWE Sales Forecasting and Rate Model User Guide



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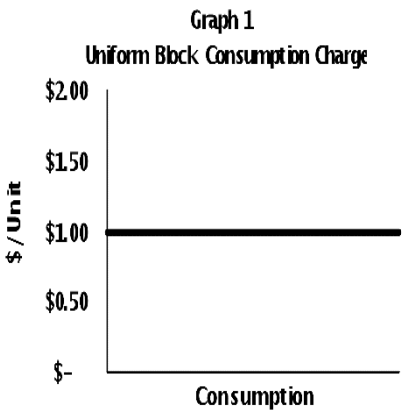
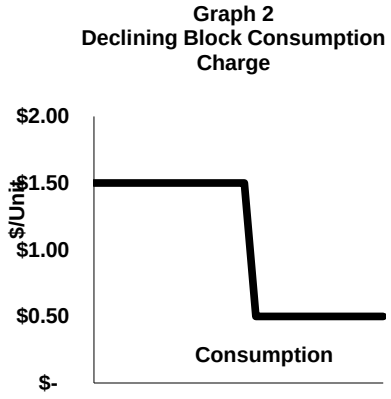
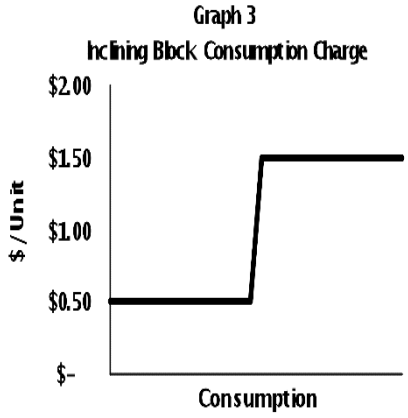
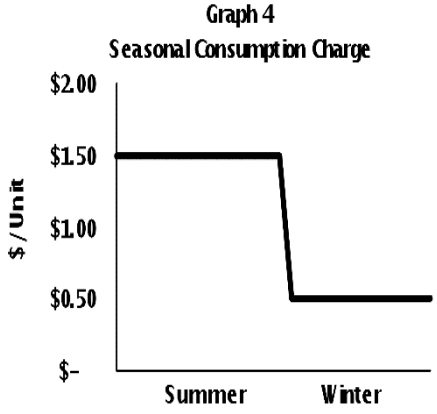
Introduction to Rate Setting





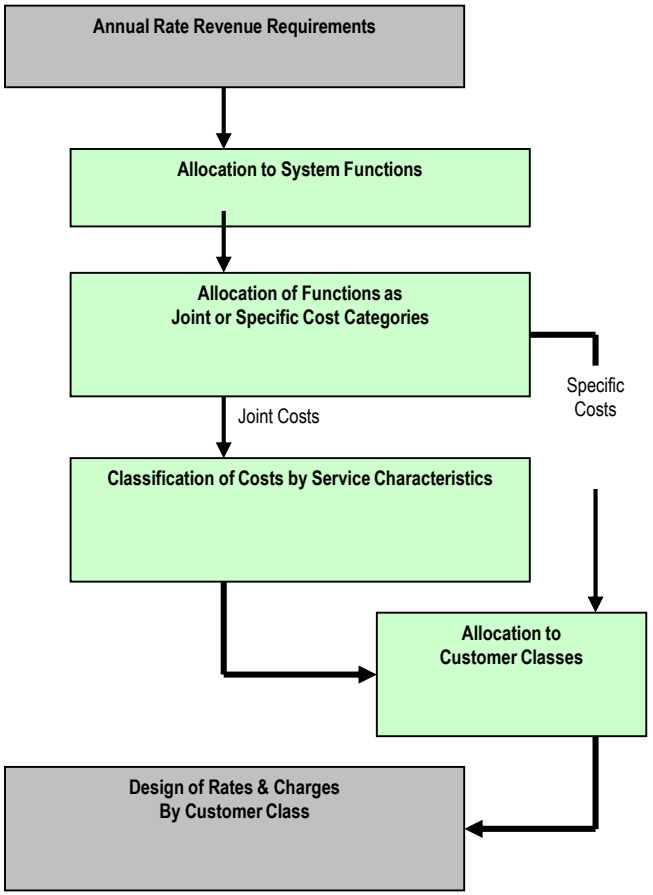




- Budget-based water rates
- Marginal/Incremental Cost pricing
- Volumetrically-based Fixed Charges
- “Value of Service” pricing
- Policy-based rates
- Drought pricing
- Additional “innovative” rate structures

Building an Efficiency-Oriented Structure

- Identify and Prioritize Ratemaking Objectives
- Determine Revenue Requirements
- Allocate Costs
- Design A Rate Structure
- Evaluate the Rate Structure against Objectives
- Decide on a Rate Structure



What Answers Are Needed?

In an uncertain world, what information could lead to better water rates?

- *Customer Consumption Variability*—How can weather, drought/shortage, or external shock affect customer consumption?
- *Demand Response*—If I change rates, what happens to demand volume and revenue?
- *Drought Pricing*—How should I plan for water rates under the contingency of nonzero drought/shortage occurrence?
- *Probability Management*—What is the likelihood of deficit?
- *Fiscal Sustainability*—What are likelihoods over a 5-year time horizon
- *Affordability*—Can customers afford water service?

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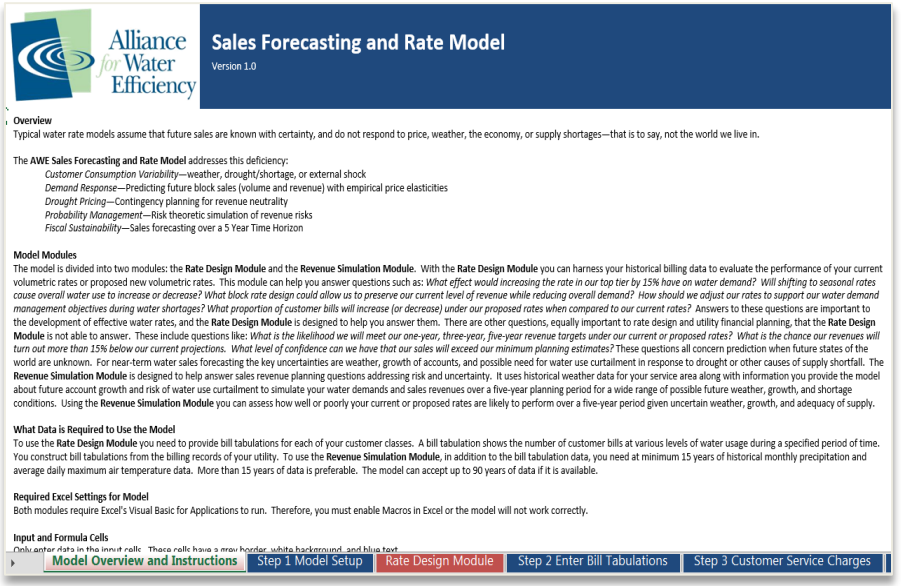
Tools to Evaluate Rates

- Modeling Water Demand Variability
- Modeling Water Revenue Variability
- Customer Bill Analysis
- Affordability Assessment
- Assessing Fiscal Sustainability
- The AWE Sales Forecasting and Rate Model can do all this!



Alliance for Water Efficiency

Sales Forecasting and Rate Model

Version 1.0

Overview

Typical water rate models assume that future sales are known with certainty, and do not respond to price, weather, the economy, or supply shortages—that is to say, not the world we live in.

The **AWE Sales Forecasting and Rate Model** addresses this deficiency:

Customer Consumption Variability—weather, drought/shortage, or external shock
Demand Response—Predicting future block sales (volume and revenue) with empirical price elasticities
Drought Pricing—Contingency planning for revenue neutrality
Probability Management—Risk theoretic simulation of revenue risks
Fiscal Sustainability—Sales forecasting over a 5 Year Time Horizon

Model Modules

The model is divided into two modules: the **Rate Design Module** and the **Revenue Simulation Module**. With the **Rate Design Module** you can harness your historical billing data to evaluate the performance of your current volumetric rates or proposed new volumetric rates. This module can help you answer questions such as: *What effect would increasing the rate in our top tier by 15% have on water demand? Will shifting to seasonal rates cause overall water use to increase or decrease? What block rate design could allow us to preserve our current level of revenue while reducing overall demand? How should we adjust our rates to support our water demand management objectives during water shortages? What proportion of customer bills will increase (or decrease) under our proposed rates when compared to our current rates?* Answers to these questions are important to the development of effective water rates, and the **Rate Design Module** is designed to help you answer them. There are other questions, equally important to rate design and utility financial planning, that the **Rate Design Module** is not able to answer. These include questions like: *What is the likelihood we will meet our one-year, three-year, five-year revenue targets under our current or proposed rates? What is the chance our revenues will turn out more than 15% below our current projections. What level of confidence can we have that our sales will exceed our minimum planning estimates?* These questions all concern prediction when future states of the world are unknown. For near-term water sales forecasting the key uncertainties are weather, growth of accounts, and possible need for water use curtailment in response to drought or other causes of supply shortfall. The **Revenue Simulation Module** is designed to help answer sales revenue planning questions addressing risk and uncertainty. It uses historical weather data for your service area along with information you provide the model about future account growth and risk of water use curtailment to simulate your water demands and sales revenues over a five-year planning period for a wide range of possible future weather, growth, and shortage conditions. Using the **Revenue Simulation Module** you can assess how well or poorly your current or proposed rates are likely to perform over a five-year period given uncertain weather, growth, and adequacy of supply.

What Data is Required to Use the Model

To use the **Rate Design Module** you need to provide bill tabulations for each of your customer classes. A bill tabulation shows the number of customer bills at various levels of water usage during a specified period of time. You construct bill tabulations from the billing records of your utility. To use the **Revenue Simulation Module**, in addition to the bill tabulation data, you need at minimum 15 years of historical monthly precipitation and average daily maximum air temperature data. More than 15 years of data is preferable. The model can accept up to 90 years of data if it is available.

Required Excel Settings for Model

Both modules require Excel's Visual Basic for Applications to run. Therefore, you must enable Macros in Excel or the model will not work correctly.

Input and Formula Cells

Only enter data in the input cells. These cells have a gray border, white background, and blue text.

Model Overview and Instructions | Step 1 Model Setup | Rate Design Module | Step 2 Enter Bill Tabulations | Step 3 Customer Service Charges

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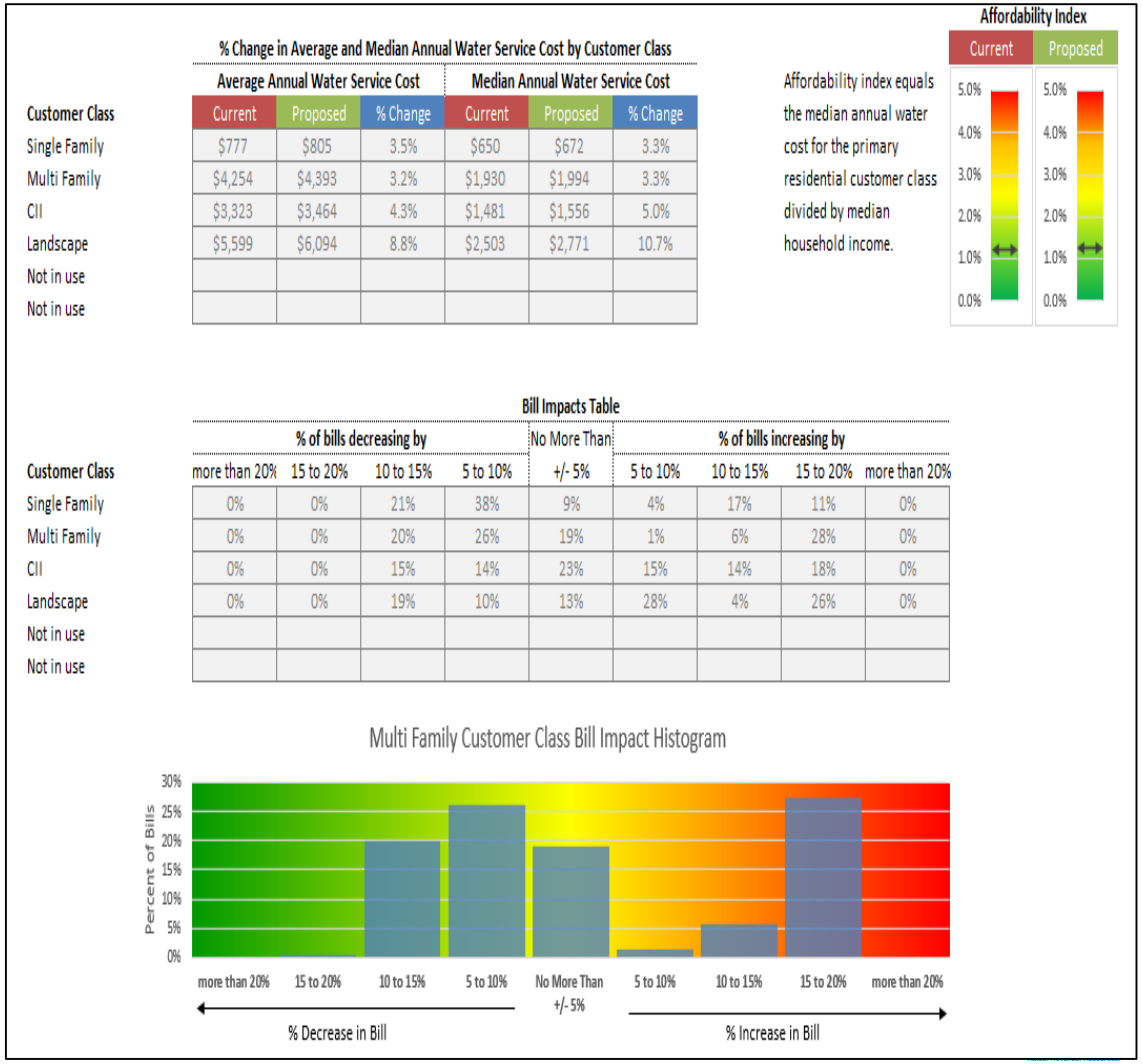
Affordability Resources

- Average Bills less than some fraction of median income in community (USEPA) does not guarantee “affordability”
- Need in-depth and informative understanding of affordability in your service area
- Resources:
  - UNC EFC Water Rates Affordability Assessment Tool
  - The *Affordability Assessment Tool for Federal Water Mandates* from AWWA, WEF and the US Conference of Mayors

Affordability of Water Service

- AWE Sales Forecasting and Rate Model helps anticipate the impact of rate changes
- This can be used to help clearly explain changes to customers, Councils and Boards
- Provides clarity, reassurance, and an opportunity to make changes before a rate adjustment takes place



% Change in Average and Median Annual Water Service Cost by Customer Class

Customer Class	Average Annual Water Service Cost			Median Annual Water Service Cost		
	Current	Proposed	% Change	Current	Proposed	% Change
Single Family	$777	$805	3.5%	$650	$672	3.3%
Multi Family	$4,254	$4,393	3.2%	$1,930	$1,994	3.3%
CII	$3,323	$3,464	4.3%	$1,481	$1,556	5.0%
Landscape	$5,599	$6,094	8.8%	$2,503	$2,771	10.7%
Not in use						
Not in use						

Affordability index equals the median annual water cost for the primary residential customer class divided by median household income.

Affordability Index

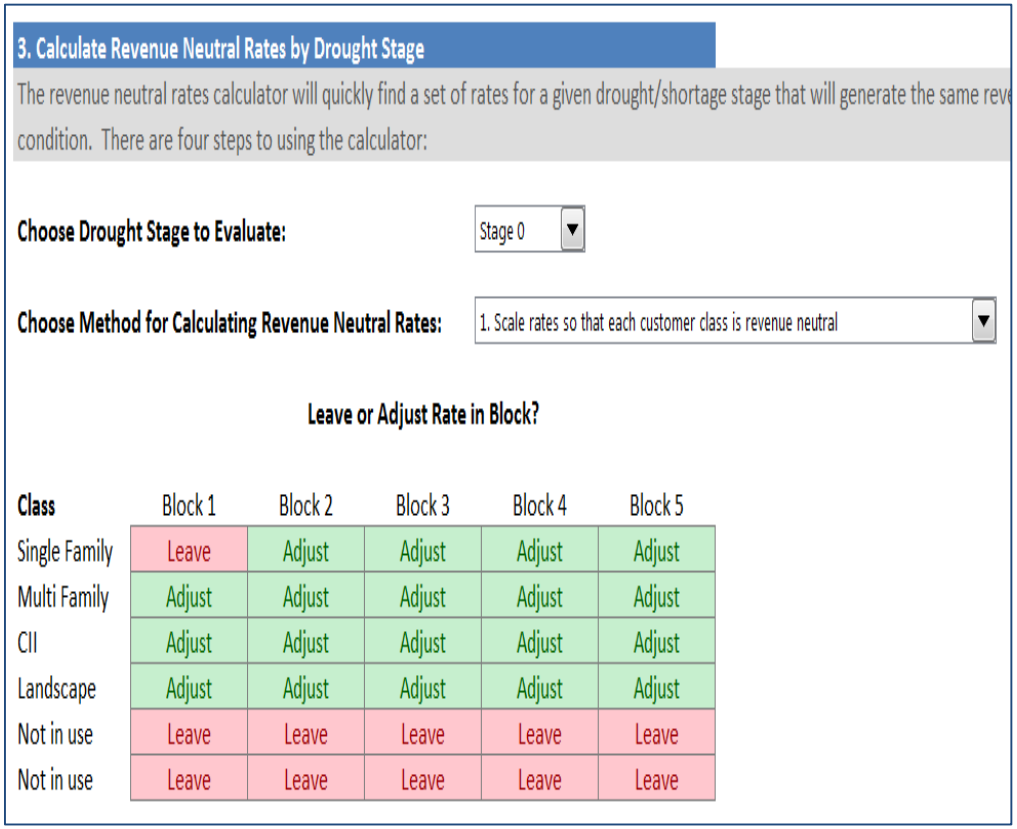
Bill Impacts Table

Customer Class	% of bills decreasing by				No More Than	% of bills increasing by			
	more than 20%	15 to 20%	10 to 15%	5 to 10%	+/- 5%	5 to 10%	10 to 15%	15 to 20%	more than 20%
Single Family	0%	0%	21%	38%	9%	4%	17%	11%	0%
Multi Family	0%	0%	20%	26%	19%	1%	6%	28%	0%
CII	0%	0%	15%	14%	23%	15%	14%	18%	0%
Landscape	0%	0%	19%	10%	13%	28%	4%	26%	0%
Not in use									
Not in use									

Multi Family Customer Class Bill Impact Histogram

Drought Pricing for Revenue Neutrality

- Shortages are when, not if.
- Imposing curtailments on customers affects revenues.
- Drought rates that maintain revenue neutrality through various drought stages can be planned for, communicated, and effectively implemented.



3. Calculate Revenue Neutral Rates by Drought Stage

The revenue neutral rates calculator will quickly find a set of rates for a given drought/shortage stage that will generate the same reve
condition. There are four steps to using the calculator:

Choose Drought Stage to Evaluate: Stage 0

Choose Method for Calculating Revenue Neutral Rates: 1. Scale rates so that each customer class is revenue neutral

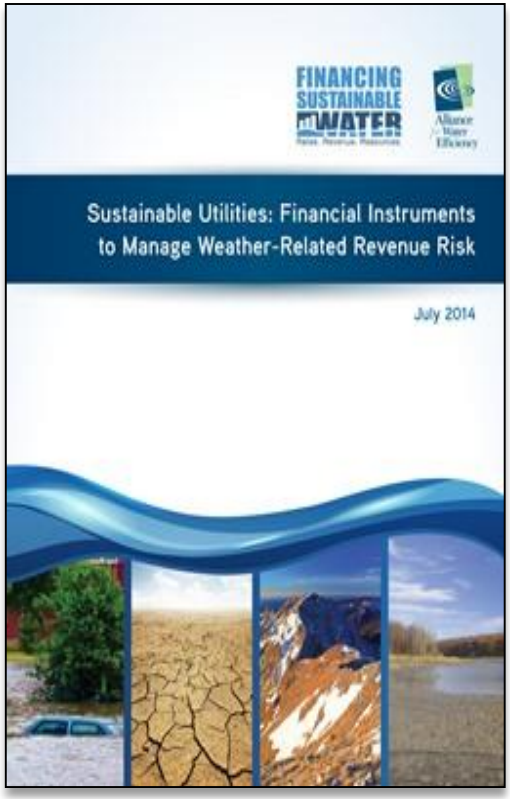
Leave or Adjust Rate in Block?

Class	Block 1	Block 2	Block 3	Block 4	Block 5
Single Family	Leave	Adjust	Adjust	Adjust	Adjust
Multi Family	Adjust	Adjust	Adjust	Adjust	Adjust
CII	Adjust	Adjust	Adjust	Adjust	Adjust
Landscape	Adjust	Adjust	Adjust	Adjust	Adjust
Not in use	Leave	Leave	Leave	Leave	Leave
Not in use	Leave	Leave	Leave	Leave	Leave

Managing Weather Risk

- Wide swings in revenue between wet years and dry years
- Need to explore market-based financial tools for managing weather risk (insurance, derivatives)
- Example: municipal snow removal insurance
- AWE published white paper in 2014
- Posted at

www.financingsustainablewater.org



Financial Planning and Policies

- Revenue and Expense Forecasting
- Revenue Management and Fiscal Sustainability
- Rate Stabilization – Financial Planning
- Adaptive Rate Design
- Revenue Recovery Mechanisms
- Cost Recovery Mechanisms
- Conclusion: Transformational Change for Efficiency
- Case Study: Birmingham, Alabama (http://efc.web.unc.edu/2012/08/01/the-success-story-of-one-water-utilitys-financial-policies/)

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Improving your Credit Rating*

1. A Rate Stabilization Fund (used not too often)
2. A low dependence on connection fees
3. Significant portion of revenues from fairly reliable customers
4. Insignificant additional upcoming debt
5. Fully-funded pension and post employment benefits
6. Strong management team

*Source: UNC Environmental Finance Center

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How Much is Enough in Reserve?

- Policy Example: Contra Costa Water District
  - "The Rate Stabilization Reserve Fund will be drawn down to smooth rate increases consistent with the District's Rate Setting Policy and to ensure that minimum debt service coverage of 1.25 times annual debt service is met. Specifically, they will be applied in any year where other revenues are not sufficient to meet the required debt service coverage ratio of 1.25 times. They will also be applied if meeting only minimum coverage levels could result in the District's bond ratings being downgraded."
- Probability Analysis in setting appropriate reserve levels:
  - Sam Savage and Shayne Kavanaugh, The Sequestron Analytics Magazine, November/December 2013

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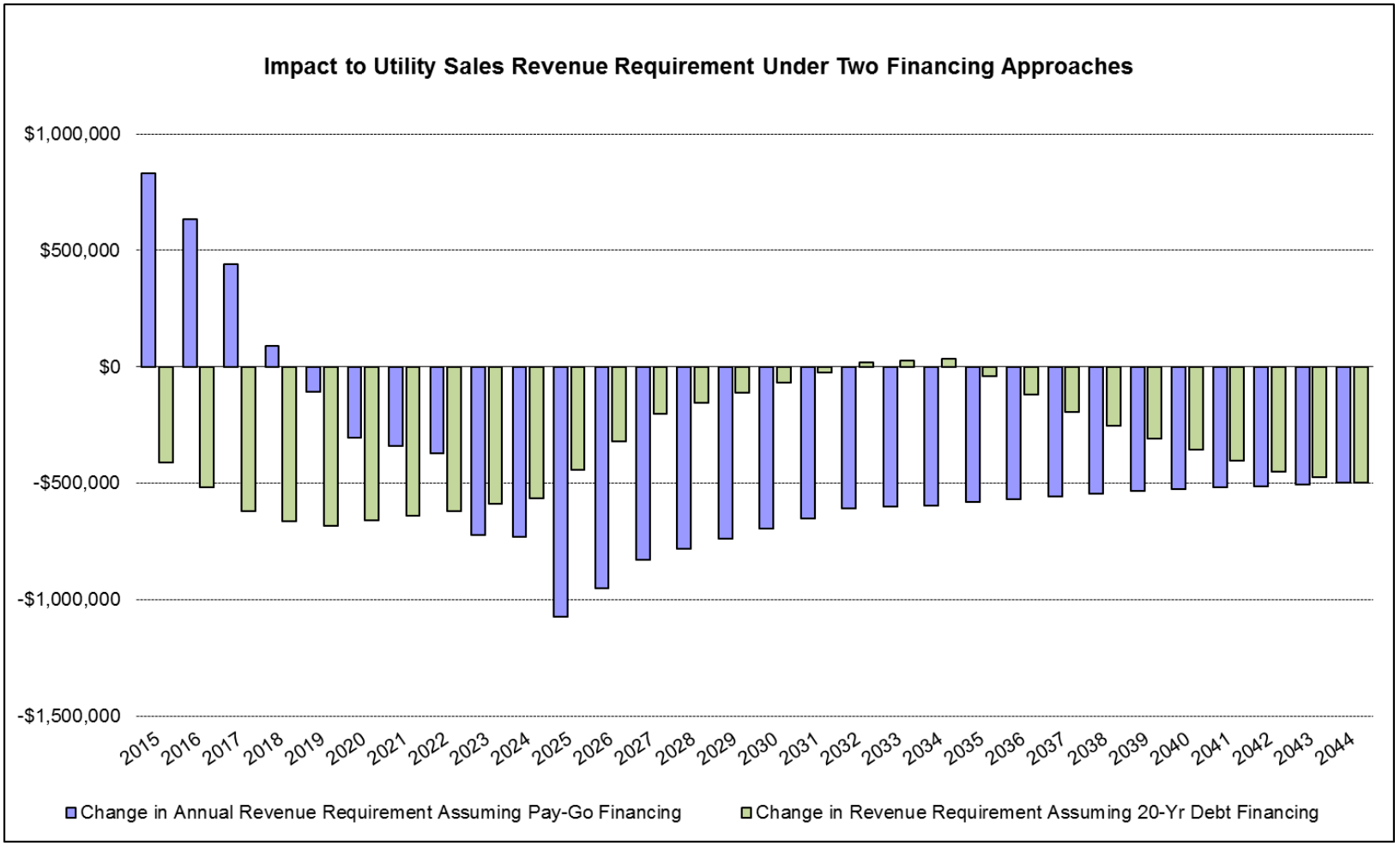
Revenue Requiremnt Impact



Why not Debt Finance Conservation?

- Most utilities NOT debt financing conservation
- Issue is Government Accounting Standards Board (GASB) rules
- Accounting principles require assignment of an "asset" to the debt
- Conservation is not "owned" by the utility – it is usually on the customer's side of the meter
- Without "control of the asset" a utility CFO doesn't want to debt finance and have a liability without an asset on the balance sheet
- We are working with GASB to fix this

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Other Financing Solutions

- WIFIA
- Other Opportunities
  - Green/Climate Bonds
  - State Revolving Funds
  - Public-Private Partnerships
  - Tax Initiatives
  - State-level funding (Colorado Water Conservation Board)

Communicating Change

The Political Reality

- We don't like to revise our rates
- It is politically unpopular, so rates are changed as little as possible
- The inevitable inflationary increase is postponed until it is a crisis, much less increases in other costs
- Conservation is often blamed for financial challenges – even when there are no active conservation programs in place
- This sends the wrong message to consumers

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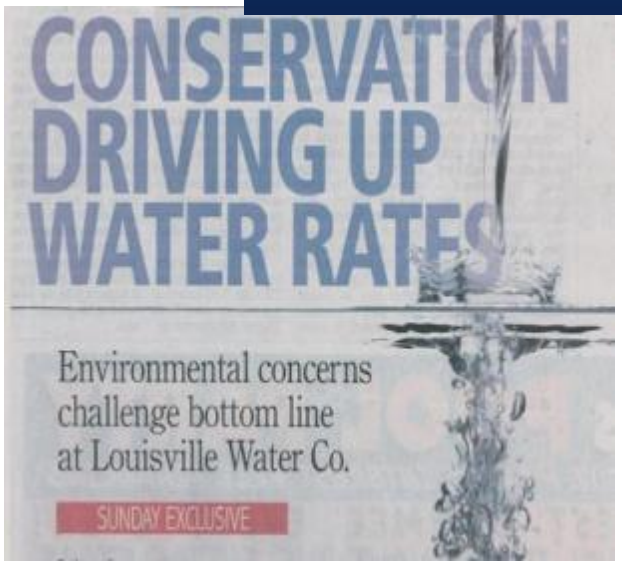

THE GLOBE AND MAIL

Reduced water use drains Toronto's funds for infrastructure upgrades

Raleigh Public Record

Raleigh's Water Conundrum: Conservation v. Rates

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CARS HOMES APARTMENTS CLASSIFIEDS PLACE AN AD SHOPPING

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News Sports Lifestyle

FEATURED: Photos Video Showclock Neighborhoods DealChicken

Conservation driving up water rates in Louisville

Environmental concerns challenge bottom line at Louisville Water Co.

2:03 AM, Jul. 28, 2013

The San Diego Union-Tribune

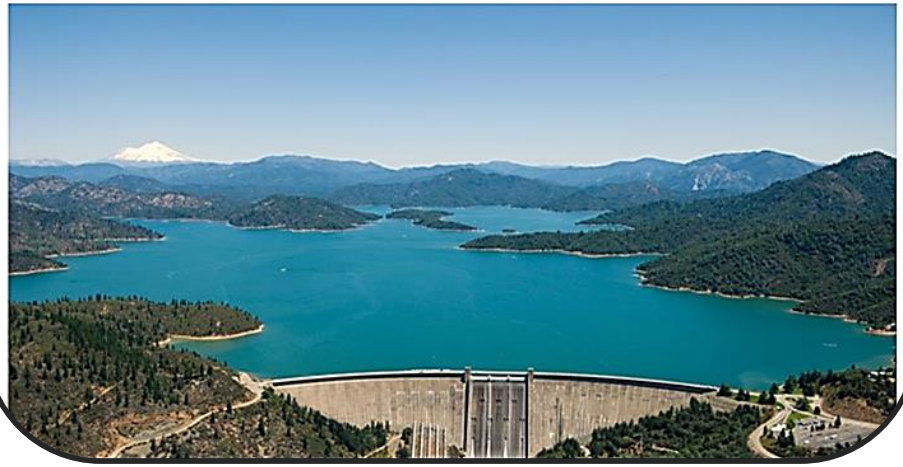
Today's Paper Weather 76° F Traffic Surf News

NEWS SPORTS BUSINESS A&E LIFESTYLE MILITARY OPINION VIDEO OBITS DEALS & CLASSIFIL

Saving water adds up to rate hikes

Conservation hurts agency finances, so rates must increase

By Morgan Cook and Bradley J. Fikes | 7:09 a.m. July 27, 2015 | Updated, 8:21 a.m.



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Punished For Conserving, Californians See Water Rates Rise As Cities Lose Money In Drought

July 5, 2015 11:52 AM

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IS WATER CONSERVATION REALLY BANKRUPTING TEXAS CITIES, OR ARE THEY JUST BAD AT PLANNING?

A A BY AMY SILVERSTEIN WEDNESDAY, FEBRUARY 19, 2014 | 2 YEARS AGO

33 7 0

The Trinity River bed.

AgriLife Today

The people of Fort Worth have been doing a good job of using their water sparingly, and that has the Fort Worth Water Department very, very worried.

cent news reports claim that Fort Worth has been

THE LATEST


Morning Report: Investigation Launched

The city's water department plans to increase rates by more than 40 percent in the next five years.

By July 2020, a unit of water that today costs $4.36 will cost $6. Customers also pay meter fees, which will also rise.

So what's driving the soaring rates? This is awkward but ... you're part of the problem. You and a bunch of other factors. Let's run through them.

You can blame yourself for saving too much water.

The price hikes are driven – ironically enough – by the cutbacks San Diegans are making because of the drought. If the city is selling less water, then the city has to charge more for each drop it sells.

The city sold about 76 million units of water in 2014. Each unit is about 750 gallons. Next year, the city only expects to sell 64 million units because of water-use restrictions mandated by the state.

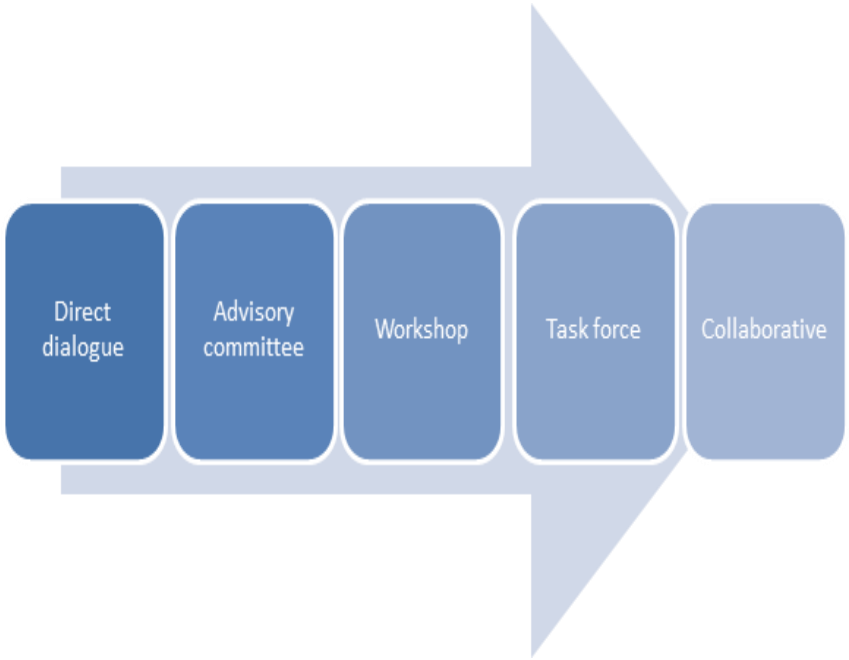
Gordon Hess, vice chairman of the Rates Oversight Committee, said he worries the city's five-year plan is based on long-term projections that could be wrong.

"In the outer years, do we still need those rate increases?" he said. "Those may or may not be needed if sales rebounded or we get a wetter year."

Interested in Water narrative?
Follow

Public Engagement

- Integrated and Collaborative Planning
- Securing Buy-In from Leadership
- Getting to Yes: Approval from Elected Officials
- Internal Communications and Customer Service
- The Public as Partners
- Clear Signals and Empowered Customers
- Maintaining Dialogue and Fine-tuning



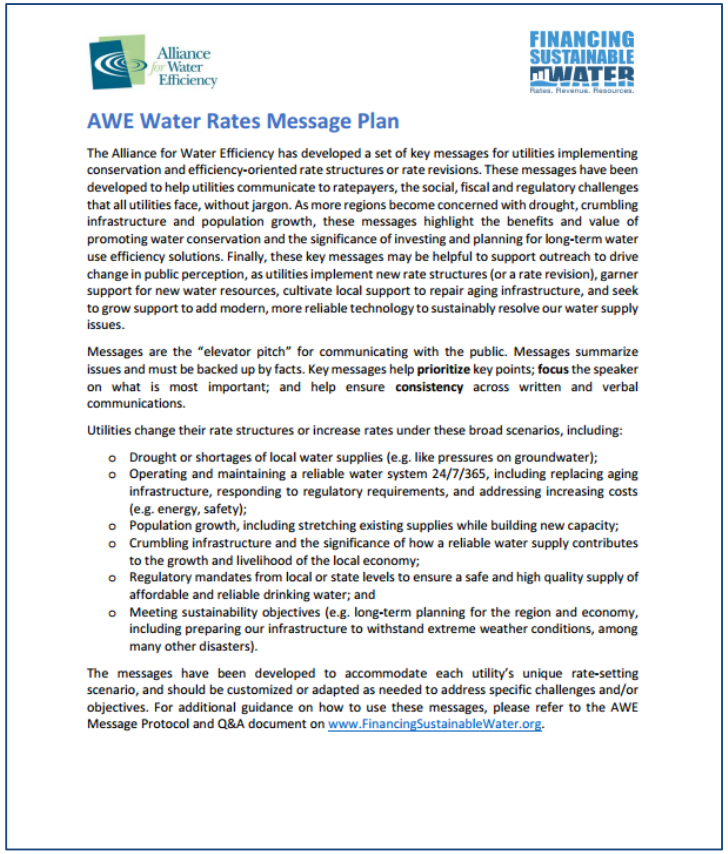
Communicating the Value of Water

- Water: What You Pay For Video
  - Explains water service and cost
  - Pipes, plants, power and people that keep water flowing
  - Free for utility use!
- Water Rates Messaging
  - Consumer-friendly language
  - Explain that conservation keeps rates DOWN in the long term
  - Use for speeches, talking points, press releases, etc.

"Every gallon saved is a gallon that doesn't need to be pumped, treated or delivered – those savings are reflected in your water bill. **Conservation helps slow the rise of water rates over the long-term."**

Let's Change the Conversation

- Water Rates Message Plan
- Jargon-free messages on:
  - The service and value water utilities provide
  - Benefits and value of efficiency investments
  - The need for a rate revision or new rate structure
  - The relationship between conservation and rates
  - The impact of drivers such as drought or water quality
- Customizable to tell your story!
- www.FinancingSustainableWater.org



Alliance for Water Efficiency

FINANCING SUSTAINABLE WATER
Rates. Revenue. Resources.

AWE Water Rates Message Plan

The Alliance for Water Efficiency has developed a set of key messages for utilities implementing conservation and efficiency-oriented rate structures or rate revisions. These messages have been developed to help utilities communicate to ratepayers, the social, fiscal and regulatory challenges that all utilities face, without jargon. As more regions become concerned with drought, crumbling infrastructure and population growth, these messages highlight the benefits and value of promoting water conservation and the significance of investing and planning for long-term water use efficiency solutions. Finally, these key messages may be helpful to support outreach to drive change in public perception, as utilities implement new rate structures (or a rate revision), garner support for new water resources, cultivate local support to repair aging infrastructure, and seek to grow support to add modern, more reliable technology to sustainably resolve our water supply issues.

Messages are the "elevator pitch" for communicating with the public. Messages summarize issues and must be backed up by facts. Key messages help **prioritize** key points; **focus** the speaker on what is most important; and help ensure **consistency** across written and verbal communications.

Utilities change their rate structures or increase rates under these broad scenarios, including:

- Drought or shortages of local water supplies (e.g. like pressures on groundwater);
- Operating and maintaining a reliable water system 24/7/365, including replacing aging infrastructure, responding to regulatory requirements, and addressing increasing costs (e.g. energy, safety);
- Population growth, including stretching existing supplies while building new capacity;
- Crumbling infrastructure and the significance of how a reliable water supply contributes to the growth and livelihood of the local economy;
- Regulatory mandates from local or state levels to ensure a safe and high quality supply of affordable and reliable drinking water; and
- Meeting sustainability objectives (e.g. long-term planning for the region and economy, including preparing our infrastructure to withstand extreme weather conditions, among many other disasters).

The messages have been developed to accommodate each utility's unique rate-setting scenario, and should be customized or adapted as needed to address specific challenges and/or objectives. For additional guidance on how to use these messages, please refer to the AWE Message Protocol and Q&A document on www.FinancingSustainableWater.org.

FSW
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FINANCING SUSTAINABLE WATER

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A project of the Alliance for Water Efficiency

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Financing Sustainable Water is an initiative of the Alliance for Water Efficiency. It was created to provide practical information to guide utilities from development through implementation of rate structures that balance revenue management, resource efficiency and fiscal sustainability. This website will be updated frequently with new content and we encourage visitors to return often for additional information and resources. The Alliance serves as a North American advocate for water efficient products and programs, and provides information and assistance on water conservation efforts. Learn More

WATER MANAGERS

Find guidance on sustainable financial management

ELECTED OFFICIALS

Support your utility through smart management practices

CONCERNED CITIZENS

Learn how you can help create a sustainable water future

MEDIA

Get facts on today's water challenges and solutions

RATES HANDBOOK
Building Better Rates for an Uncertain World

RATE MODEL
Sales Forecasting and Rate Model

RECENT NEWS

- Welcome to Financing...

FEATURED RESOURCES

- Case Study: Cobb County
  Public Engagement Success
- Report: Westminster, CO
  Conservation Lowers Rates

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