



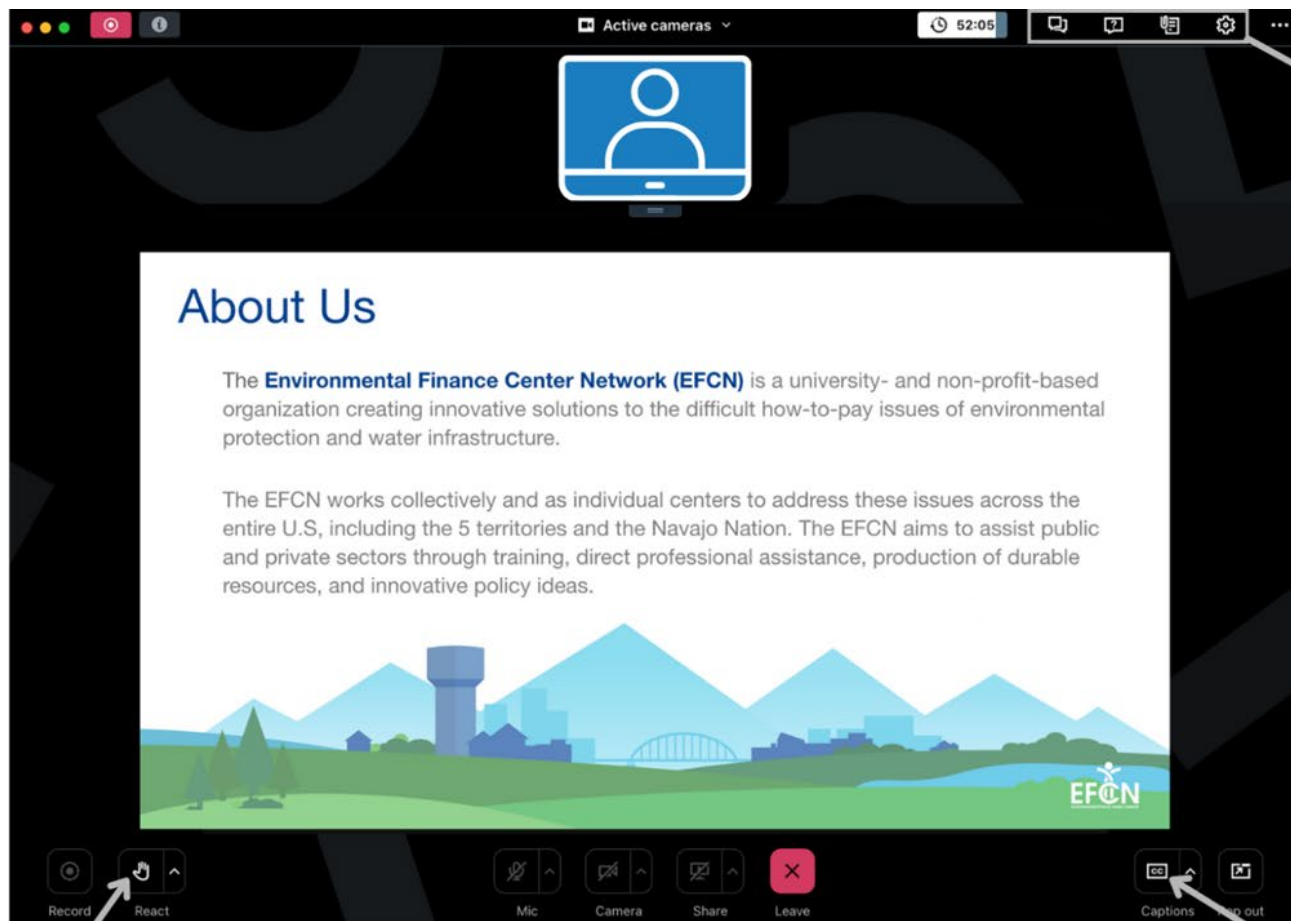
ENVIRONMENTAL
FINANCE CENTER

Rate Setting and Affordability Assessment for Small Systems

(Tuesday, October 13, 2026)



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Chat

Materials



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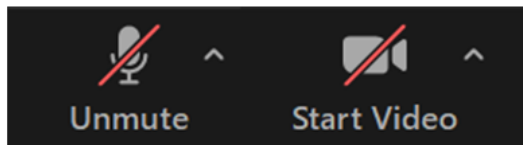
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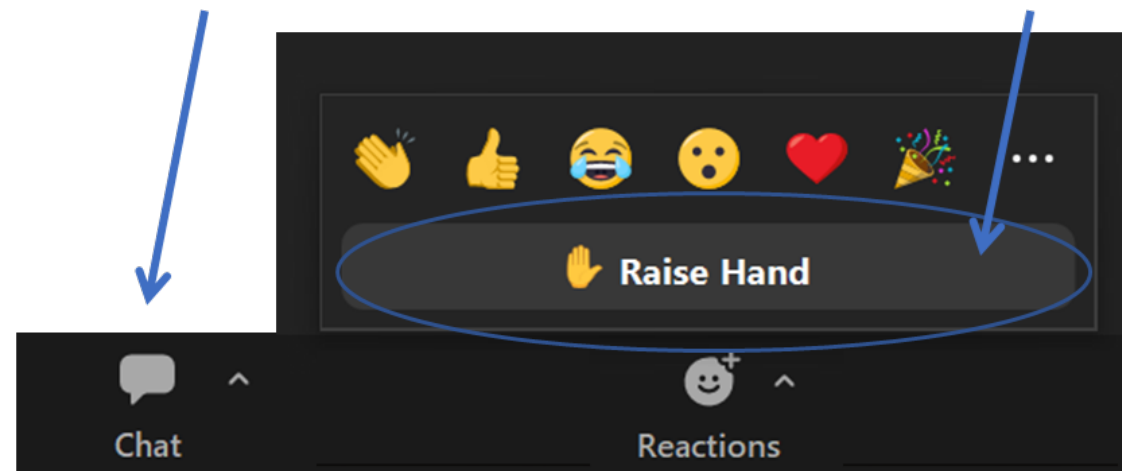
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If you have questions or need assistance, please contact smallsystems@syrr.edu.

About Us

The **Environmental Finance Center Network (EFCN)** is a university- and non-profit-based organization creating innovative solutions to the difficult how-to-pay issues of environmental protection and water infrastructure.

The EFCN works collectively and as individual centers to address these issues across the entire U.S, including the 5 territories and the Navajo Nation. The EFCN aims to assist public and private sectors through training, direct professional assistance, production of durable resources, and innovative policy ideas.



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- Regulatory Compliance
- Rate Setting & Affordability
- Asset Management
- System Performance
- Public Engagement
- Utility Management
- Succession Planning



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University of Maryland Environmental Finance Center

30+ years serving communities

- Advance solutions to environmental challenges, with a focus on effective funding and financing approaches
- Provide extra capacity to local governments, water utilities, community organizations and state agencies



Climate & Energy



Water



Green Infrastructure



Sustainability



Agriculture

Agenda

- Understand the fundamentals of water rate setting.
- Identify common rate structures and considerations for selecting an appropriate structure.
- Evaluate the affordability of water rates, particularly for low-income customers.
- Use rate analysis and affordability assessment tools to support rate-setting decisions.
- Identify tools and resources available to help evaluate rate sufficiency and affordability.

Rate Setting Fundamentals

Definitions

- **Rates** : price per month or consumption level (e.g. \$35/month; \$4.50/1,000 gallons)
- **Rate structures** : rules by which different rates are applied to customers

There is no one perfect rate structure.

Why is rate setting important?

Benefits of annual rate setting:

- Maintain your system's financial stability by ensuring a sufficient revenue stream
- Collect and reserve the funds needed to cover the costs of future asset rehabilitation and repair projects, security upgrades, and compliance with future regulations
- Plan ahead for reasonable, gradual rate increases when necessary
- Deliver fairly priced, high-quality drinking water to your customers now and in the future

Regulatory requirements

Safe Drinking Water Act Amendments of 1996 requires systems to maintain:

- Technical capacity
- Management capacity
- ***Financial capacity***
 - ***Sufficient revenues***
 - Credit worthiness
 - Adequate budgeting
 - Fiscal management controls

Guiding principles for sound rate design

Many considerations go into rate design:

- Will these rates cover our costs?
- How will our revenue be affected if water demand changes?
- Can our customers understand these rates? Afford them?
- Are we following applicable laws?
- Are we allocating costs to the right customers?
- Do these rates send the right signals to our customers?

Rate-setting is:

- Part science, part art
- An iterative and ongoing process

The rate-setting process

Learn background information about rates



Understand your customers and your utility,
including your rate-setting objectives



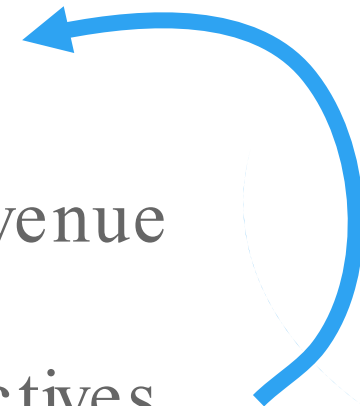
Design an appropriate rate structure



Compute rates using projected costs and revenue



Re-evaluate / adjust rate structure to fit objectives



Poll

Water rates should be designed to [check all that apply]

Cost & Revenue Requirements

Know your costs

To design an appropriate rate structure, it is critical to know your system's costs / revenue requirements.



Goal: Sufficient financial resources to operate effectively and efficiently now and in the future

Budget for full costs

Operations and maintenance	Principal and interest for debt service	Depreciation	Reserves
Salaries, fringe, utilities, lab fees, chemicals, supplies, rent, insurance, etc	Cost of annual principal and interest payments for debt	Annual repair & replacement expenses can be included here	Emergencies, capital improvements, debt service, reserves



Be sure to account for utility's portion of general government costs (e.g. town staff, insurance premiums, town hall operations)

Keep in mind fixed vs. variable costs

Fixed

Relatively stable regardless of volume of water used in the short term

Ex: salaries, lab, meter reading, billing, debt service, capital costs, vehicles, machinery, insurance, technical support

Variable

Fluctuate depending on the volume of water used

Ex: chemicals, energy, purchased water

Determine reserve targets

Types of reserves:

- Operating *45 days of O&M costs*
- Emergencies *12.5% of expenditures*
- Debt service *6-12 months of debt service OR as directed in debt instrument(s) or bond documents*
- Capital improvements *2.5% of revenues- but use your CIP / asset management plan!*

Capital improvements are part of the cost of providing service and must be factored into rates.

How much should you set aside?

- Best practice rule of thumb: *15%–40% of annual budget*

Determine current revenue

Example annual revenue worksheet

Operating Revenue and Interest	
Water sales	<i>\$221,456</i>
Fees and service charges (late fee, connection fee, etc)	<i>\$4,881</i>
Interest	<i>\$967</i>
Other	<i>\$711</i>
Additional Revenue (Subsidies)	
Grants	<i>\$1,824</i>
Transfer payments	<i>\$4,000</i>
Other	<i>\$432</i>
Total Annual Revenue	<i>\$234,271</i>

Determine revenue requirements

Target revenue from rates = annual costs + reserve
contributions – any non -rate revenue

Example: \$200K + \$20K – \$6K = \$214K (Revenue from Rates)

Estimate costs and revenues over the next several years.

- If revenue exceeds costs, you're in good financial shape. But re-check annually.
- If revenue is below costs, you need to reduce the gap. Options:
 - Reduce operating costs
 - Raise additional revenue (**rate change**)
 - Restructure (if revenue gap is 50% or greater)

Communicate with customers, especially if a rate increase may be needed.

For more guidance



Step-by-step guidance & worksheets to calculate:

- Annual costs
- Annual revenue
- Short-term revenue requirements
- Average monthly water usage



Setting Small Drinking Water System Rates for a Sustainable Future

One of the Simple Tools for Effective Performance (STEP) Guide Series



Different rate structures = different results

Your rate structure should:

Fit your community's circumstances

Do you have...

- High fixed costs and a small customer base?
- Many customers on low or fixed incomes?
- A seasonal community?

Align with your community's objectives

Is your priority...

- Revenue stability
- Water conservation
- Enhanced affordability for low-income customers
- Attracting business

Common rate-setting objectives

Revenue
sufficiency

Revenue stability

Conservation

Affordability

Administrative
ease

Equity

Easy for customers
to understand

Economic
development

How would you rank
your priorities?

1. **Revenue sufficiency** _____
2. _____
3. _____
4. _____
5. _____



Poll

Beyond covering costs, which ONE objective is your top priority?

Rate Structures

Core elements of rate design

Core elements
of rate design

1	2	3	4	5	6
Customer classes	Billing period	Base charge	Consumption allowance included with base charge	Volumetric rate	Number of blocks, block sizes and rate differentials

Credit for core elements section: UNC EFC. 2013. “Designing Appropriate Rate Structures for Small Water Systems” presentation.



Options:

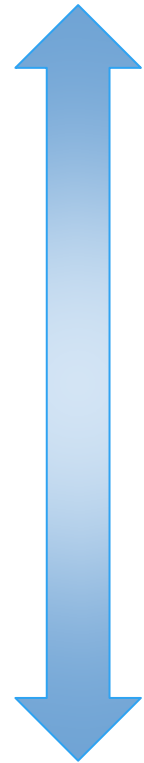
- Different structures (or rates) for:
 - Residential, commercial, industrial, wholesale, municipal, etc
 - Customers within town limits and those outside
- One rate structure but:
 - Different base charges depending on meter size
 - Blocks that indirectly target non-residential users
- Negotiated rates for individual high-use customers (usually industrial)

If you serve multiple types of customers, it may be appropriate to have **different rates or rate structures for different classes of customers** .

Should be tied to **cost of providing service** to these customers.

Billing period

Core elements of rate design: 2 of 6



Advantages for utility

- Steady monthly revenue
- Lost revenue from unpaid bills may be smaller
- More frequent communication with customers

- Easier to administer
- Reduced billing costs
- Possibly fewer late payments and cutoffs

Advantages for customers

- Smaller individual bills
- Quicker feedback on usage (leaks, conservation)

- Fewer number of bills

More frequent
(e.g. monthly)

Less frequent
(e.g. quarterly)

Recommendation: Monthly if you can afford it

Base charge

Core elements of rate design: 3 of 6



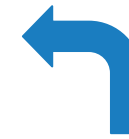
Ensure that the utility has a stable revenue stream to cover fixed costs

Fixed / Base

Set fee that customers pay regardless of the amount of water they use

Volumetric

Based on the volume of water a customer consumes



Incentivize customers to conserve water

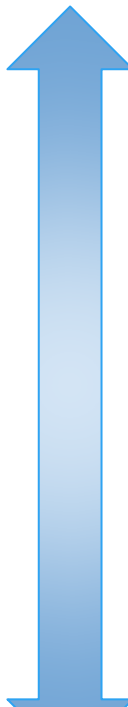
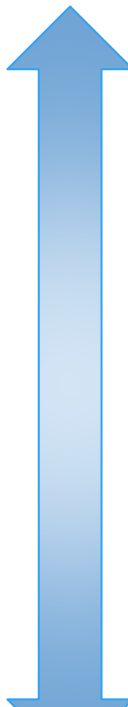
Common forms of base charges:

- Constant by customer class: e.g. residential customers = \$35/month; commercial customers = \$50/month
- By meter size: e.g. $\frac{5}{8}$ " or $\frac{3}{4}$ " meters = \$35/month; 1" meter = \$55/month; 2" meter = \$105/month

Base charge

Core elements of rate design: 3 of 6

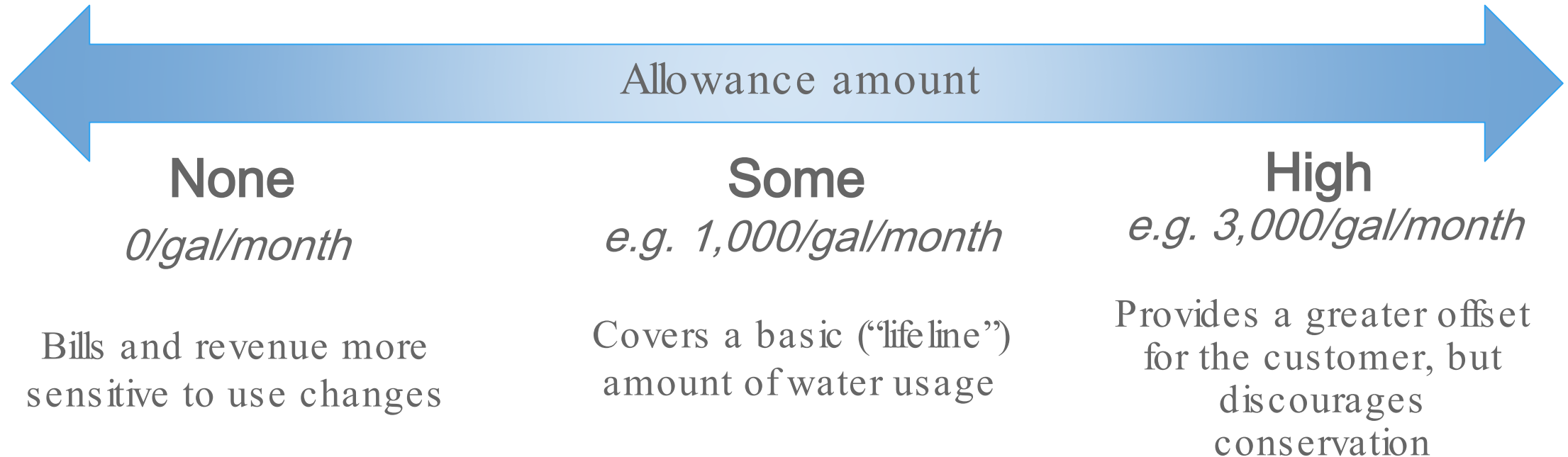


	Pros	Cons
 Higher base charge	• Greater revenue stability and predictability	• Low-use customers pay high unit price • Reduced incentive to conserve
Lower base charge 	• Provides incentive to conserve (customers see changes in bills based on use)	• Less-stable revenue; revenue may vary significantly by season

Recommendation: Smaller utilities = higher base charge

Consumption allowance

Core elements of rate design: 4 of 6



Recommendation: Low base charge = no allowance. High base charge + want to encourage conservation = moderate allowance.



Volumetric pricing

- Base charge paid regardless of how much water is used (*+/- consumption allowance*)
- Then charges are allocated based on consumption
 - e.g: \$40/month up to 3,000 gallons, then \$3/1,000 gallons

Common types:

- Uniform (“flat”)
- Seasonal
- Increasing block
- Decreasing block
- Budget-based

Volumetric rate structure

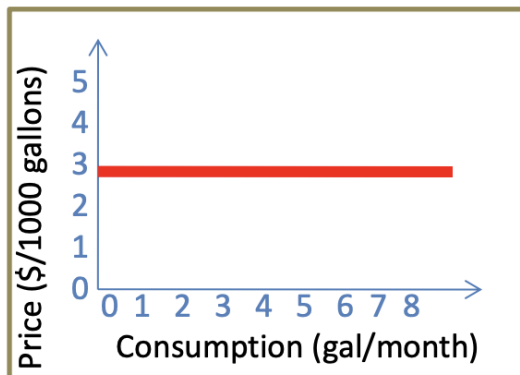
Core elements of rate design: 5 of 6



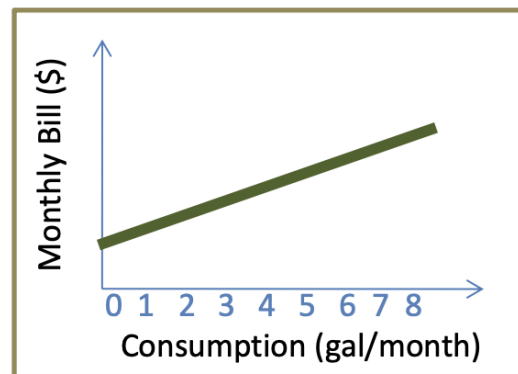
Uniform / “flat”

Constant per unit price for all metered units of water consumed.

Easy to implement and understand.



Price per gallon

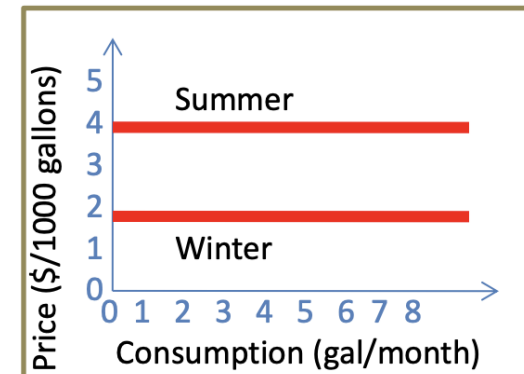


Monthly bill per consumption

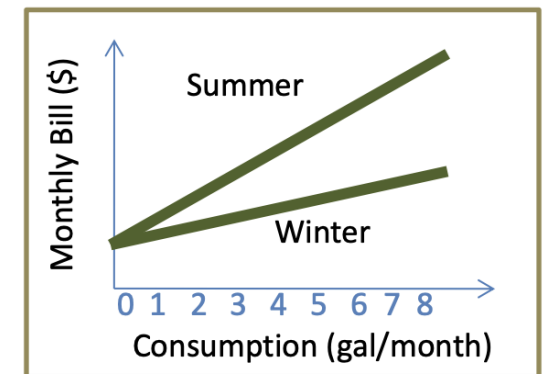
Seasonal / drought

Higher rates are charged based on seasonal demand fluctuations.

Encourages conservation; reduces peak demand. Be clear on timing and triggers.



Price per gallon



Monthly bill per consumption

Volumetric rate structure

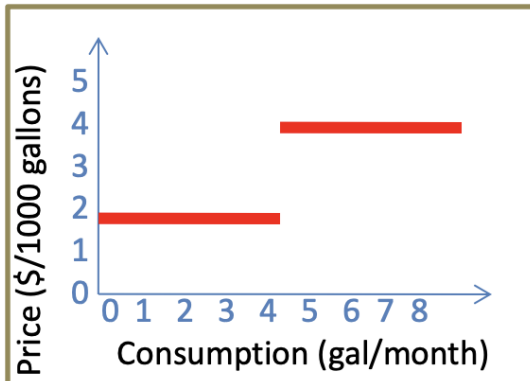
Core elements of rate design: 5 of 6



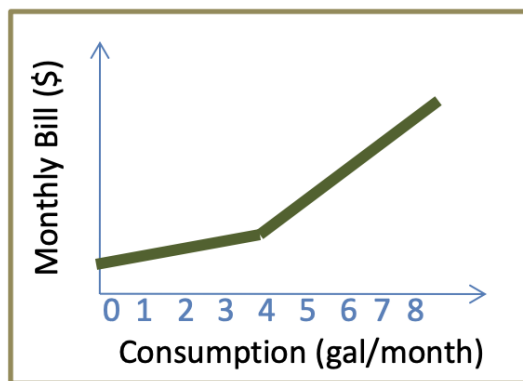
Increasing block

Cost per unit increases as usage exceeds certain thresholds. Lifeline tiered is one form (first block covers base level of use).

Provides incentive to conserve.



Price per gallon

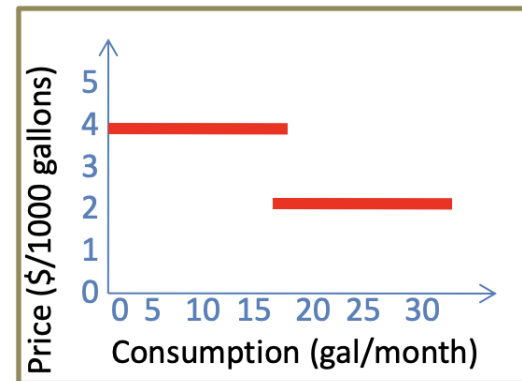


Monthly bill per consumption

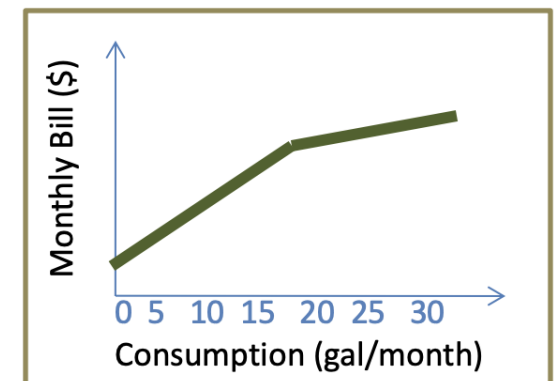
Decreasing block

Cost per unit of water decreases as usage exceeds certain thresholds.

Beneficial for large-volume users (industrial or agricultural). Little incentive to conserve.



Price per gallon



Monthly bill per consumption

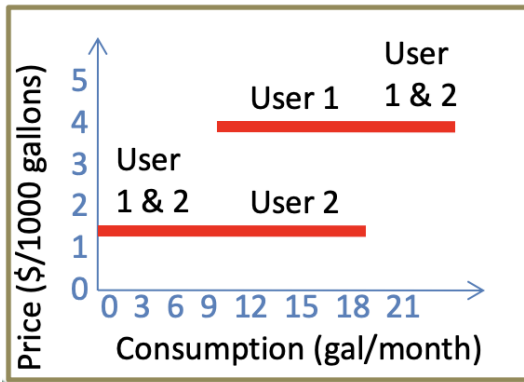
Volumetric rate structure

Core elements of rate design: 5 of 6

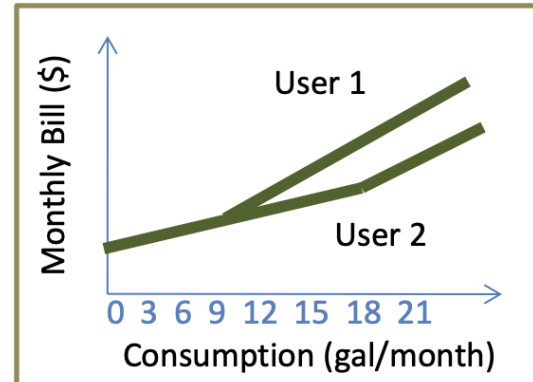


Budget -based

Provide households with a “water budget” based on number of people in household or other factors. Users are charged a certain rate for use within their budget and higher rate for use that exceeds their budget.



Price per gallon



Monthly bill per
consumption

Recommendation:

Choose the volumetric structure that aligns with your system's priority objective.



Tips for using block rates effectively:

- Decide on number of blocks and block thresholds
- Set significant rate differentials between blocks
- Keep in mind your base charge and consumption allowance
- Read meters punctually and keep up with repairs
- Consider potential effects on large households

Frequency of rate review

Decide when and how often you will review your rates; this can be specified in your planning documents so customers are not surprised.

- Annually is recommended
- Or review financial health indicators annually
 - Operating Ratio
 - Emergency Reserves
 - Debt Service Coverage Ratio
- then review your rates if any of the indicators reflect poor financing

Next steps

- Notify the public
 - Explain *why* (maintenance, upcoming expenses, inflation, etc.)
- Consider an affordability assessment

Poll

**When did your system last review its
water or sewer rates?**

Assess affordability

Why consider affordability?

- Between **12 and 19 million households** in the US may lack affordable water service¹
- **One in ten households** have water and wastewater bills that exceed the generally-accepted threshold for affordability²

¹ EPA. 2024. Water Affordability Needs Assessment.

² Cardoso, D. S., & Wichman, C. J. (2022). Water affordability in the United States. *Water Resources Research* 58, e2022WR032206. <https://doi.org/10.1029/2022WR032206>

Greater challenge for small systems

- Small customer base - higher per capita cost
- Rural service area - isolated from municipal systems; greater infrastructure costs
- Staffing shortages
- Poverty, unemployment

Costs of unaffordable rates

Low -income ratepayers

Hard choices between
paying for water /
sewer vs essential
needs

Threatened access to
essential services

Utility

Unaffordable bills =
unreliable payments

Reduced revenue

Increased costs

Community

Deferred infrastructure
maintenance and
replacement (costs
more over long term)

Less than optimal
service

It's a balancing act

Maintain
financial
sustainability;
provide good
service

Ensure rates are
affordable for
customers



What is affordability?

Affordability is a household -level issue

➔ “The ability of a customer to pay the water bill in full and on time without jeopardizing the customer’s ability to pay for other essential expenses” (EFAB 2025)

Metrics

Households are considered to face water affordability concerns when their expenditures on essential *water and sewer* services are greater than 4.5% of annual household income (EPA)

- 2.5% drinking water
- 2% wastewater

An estimated one in ten households exceed this threshold .

The lowest income decile pay on average 6.8% of their annual income on water/ww.

Poll

Has your system ever assessed rate affordability for low -income customers?

Tools

Example Utility

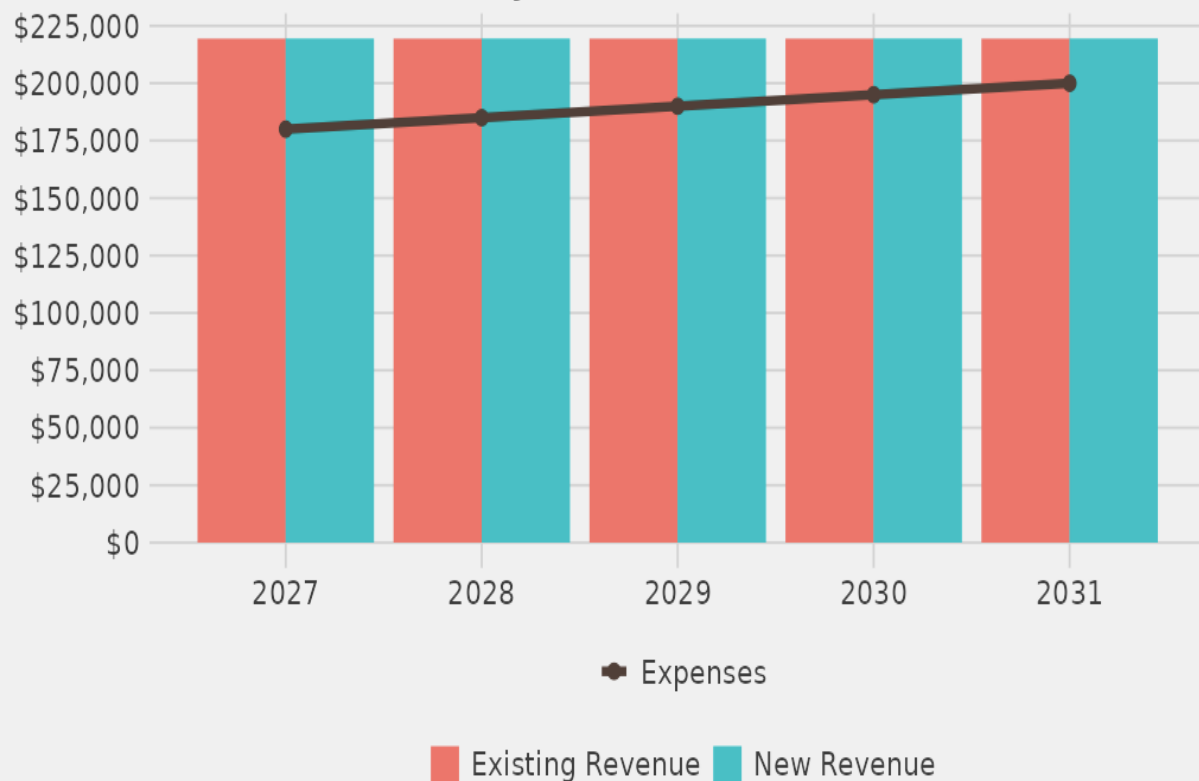
A **Utility** provides drinking water to both residential and commercial customers. Recent drought conditions have taxed their groundwater wells and the town has had to purchase water from a neighboring utility. The utility has plans to drill an additional well to increase supply, but that is a long-term project. The residential customers consume similar amounts of water, but some of the utility's commercial customers (i.e. laundromat, car wash) are high volume users.

UNC EFC's Water and Wastewater Rates Analysis Model

Tool Input	Current	
Start Date	2027	
Annual Expenses	Salaries: \$45,000 Chemicals: \$5,000 Lab Costs: \$15,000 Electricity: \$5,000 Maintenance: \$30,000 Purchased Water: \$75,000 (Inflation 0%) Inflation: 5% Total Annual: \$175,000	
Fund Balance	Current: \$150,000 Interest Rate: 2% Target: \$500,000	
Rate Structure	Billing Period: Monthly Rate Type: Uniform (Volumetric) Rate • Base Charge: \$30 • Allowance: 5,000 gallons • \$/1K Gallons: \$3	
Customer Base	Average Residential Customer Usage: 4,500 gal Number of Residential Accounts: 550	Average Commercial Customer Usage: 12,000 gal Number of Commercial Accounts: 35

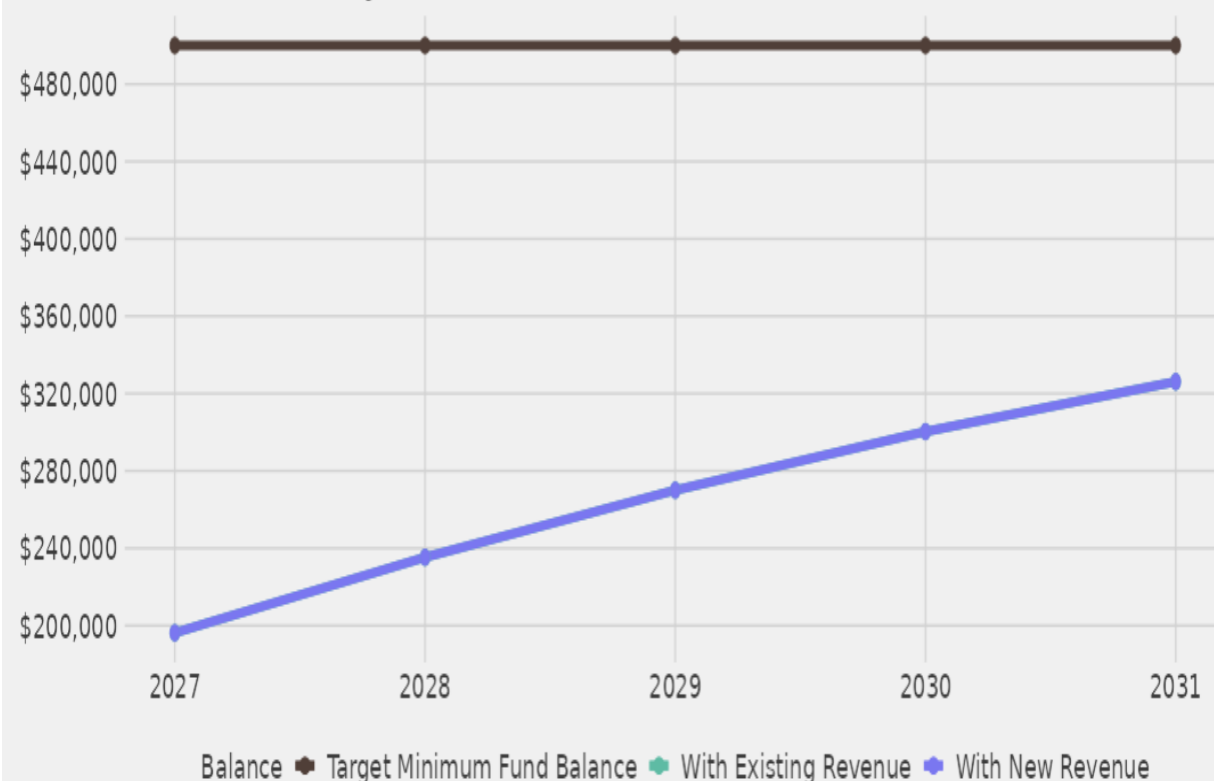
Revenue & Fund Projection

Annual Revenue Projection:



Revenue calculated based on average consumption provided for each rate in the Customers form.

Fund Balance Projection:



Revenue calculated based on average consumption and number of accounts provided for each rate in the Customers form.

Comparing Customer Bills & Fund Balance

Customer Bills	3000 gallons/month	4500 gallons/month (average residential)	12,000 gallons/month (average commercial)	Fund Balance w/o conservation (2031)	Fund Balance w/ conservation(2031)
Current	\$30/month	\$30/month	\$51/month	\$320,000	
Option 1	\$30/month	\$34.50/month	\$57/month	\$500,000	\$340,000
Option 2	\$30/month	\$34.50/month	\$81.40/month	\$540,000	\$380,000

Utility Priorities:

- Revenue Sufficiency
- Conservation
- Equity

Tool: Affordability assessment

Water And Wastewater Residential Rates Affordability Assessment Tool (UNC EFC)

Purpose: To help assess the affordability of water or wastewater rates on residential customers

Rule of thumb: Residents are rate burdened if annual spending on water and sewer bills exceeds 4.5%

Tool: Affordability assessment

Inputs

Utility Location- Tool pulls from census data

Monthly Residential Charge for 4,000 gallons

- Current e.g \$30
- Alternate e.g \$34.5

Outputs

Socioeconomic Metrics Profile

- MHI
- % of Households below the poverty level
- % Unemployed
- % on Social Security
- % of Households on SNAP benefits
- % on Supplemental Income

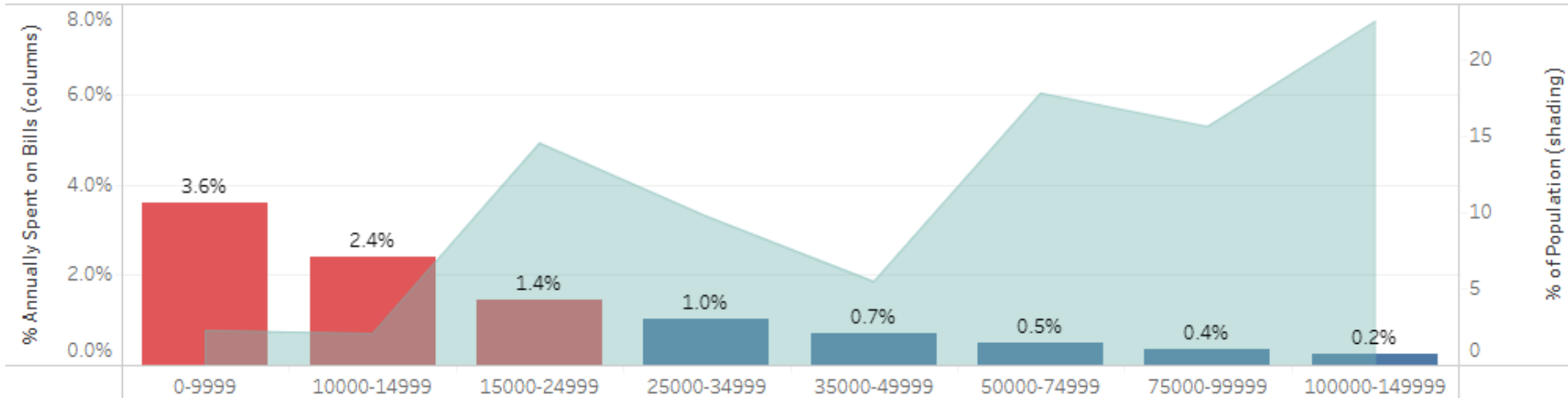
Assessment

- % of population in different income brackets
- % annually spent on bills

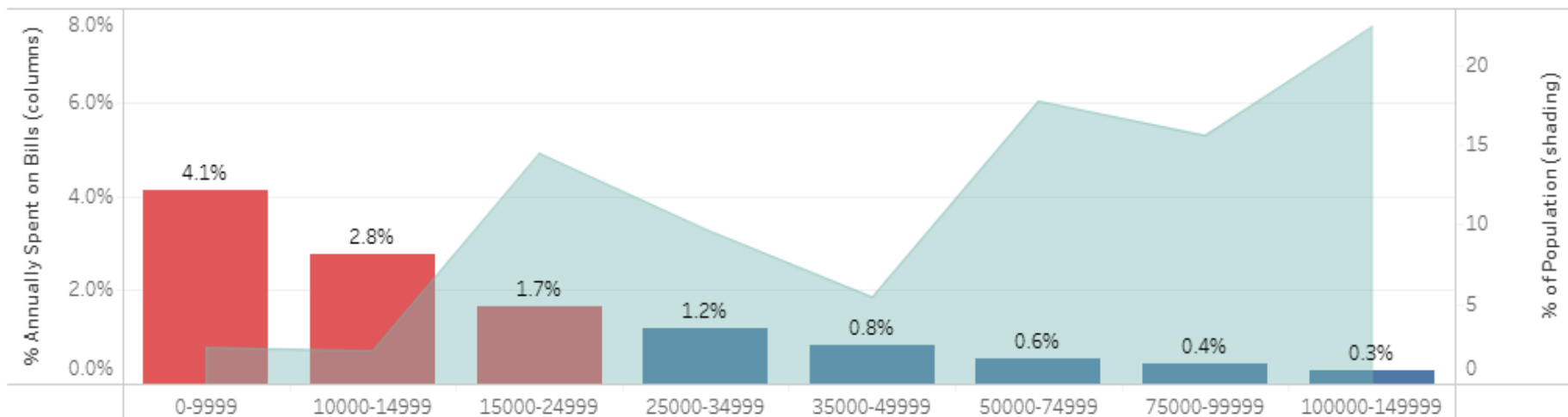
Note: Based on census data, so may not be accurate for small communities

Assessment Results

Baseline scenario: \$30.00 Water/Wastewater Rates for Emmitsburg town, Maryland at 2021 Income Levels



Proposed Alternative Scenario: \$34.50 Water/Wastewater Rates for Emmitsburg town, Maryland at 2021 Income Levels



Enhance affordability

If your affordability assessment reveals that some of your low-income customers may be burdened by your chosen rate design, there may be options for enhancing affordability for affected customers.

- Look for opportunities to operate more efficiently
- Review collection rate
 - Percent of total billing actually collected should be 95%+

Rate structures that can support affordability

Increasing block
rates (“life line rates”)

Individual rates
based on a water
budget

Class-based
volumetric rates

Seasonal rates

Uniform volumetric
rates (with caveat)

Rate structures that can pose affordability challenges

High fixed charges

First tier set too low

Decreasing block
structures

Customer Assistance Programs

- Water utility customer assistance programs (CAPs) help customers who are having trouble paying their water bills.
- These programs may offer discounts, payment plans, or other assistance.
 - Temporary financial assistance programs.
 - Reduction of rates for certain classes of customers based on affordability factors.
 - The reduction or elimination of utility fees, fixed charges, or accrued interest on late payments for qualified low-income customers.

Resources

Resources

Rate Setting

<u>Water and Wastewater Rates Analysis Model</u> (UNC EFC)	Tool	Helps users evaluate water and wastewater rates by projecting the utility's expenses, revenues from rates, and fund balance.
<u>Setting Small Drinking Water Rates for a Sustainable Future</u> (EPA)	Manual	Step-by-step guidance – including worksheets – to help small systems account for the full costs of providing safe, reliable drinking water and set rates to cover those costs.

Resources

Affordability

<u>Water And Wastewater Residential Rates Affordability Assessment Tool</u> (UNC EFC)	Tool	Allows users to assess the affordability of their water or wastewater rates on their residential customers based on Census data.
<u>Bill Payment Assistance Program Cost Estimation for Water Utilities</u> (UNC EFC)	Tool	Guides water/wastewater utility staff in estimating the costs of implementing a program to assist low-income residential customers pay their bills.
<u>Advancing Water Affordability Nationwide: A Framework for Action</u> (EFAB 2025)	Report	Developed by the US EPA Environmental Finance Advisory Board (EFAB) in response to an EFAB charge related to the affordability of water, sewer, and stormwater services.

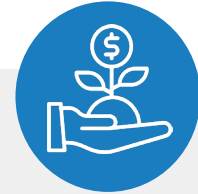
No-cost technical assistance

Small Systems program

- Drinking water, wastewater, and/or stormwater systems serving <10,000 people
- Wide variety of topics and issues covered
- Educational resources & trainings, plus technical assistance around the US

[efcnetwork.org /get-help](https://efcnetwork.org/get-help)

Plus funding support:



- Finding the **right funding** programs for your project
- Understanding **eligibility & application timelines**
- Developing strong, competitive **applications**
- Looking for funding to **match or supplement** funding you've already received

Thank You For Attending!

Take a moment to check out our resources:



Tools & Publications:

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Multimedia Library | Podcasts, Blogs, and Videos:

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State Funding Tables:

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Educators Resource Hub | Water Lesson Plans & Career Resources:

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