NEED TO KNOW

# WATER RATES:
# CONSERVATION AND REVENUE STABILITY

Supplying water to customers is a business. As in any business, water sales revenues need to be accurately forecasted and balanced against current and long-term future water supply and treatment costs. Conservation and efficiency is recognized as a way to effectively reduce long-term costs, and is often the most cost-effective "new water supply" option available. However, planning for water conservation programs must be done carefully to avoid revenue instability issues for the system.

Comprehensive water supply planning is required by law in California as well as in many other states, and is premised on the concept that water suppliers should plan water supply portfolios that guarantee long-term, sustainable delivery of safe, reliable drinking water.[i] This means prioritizing water conservation and efficiency programs in that portfolio. Water service providers can promote conservation and efficiency in a variety of ways; however, here we focus on conservation-oriented water rates.

Conservation pricing can be designed to:

- Reduce water consumption without negative impacts on utility revenues;
- Reward customers financially for choosing water-efficient appliances and changing water use behavior;
- Target inefficiency in discretionary water uses such as landscape irrigation;
- Delay costly water supply expansion projects; and
- Avoid financial hardships on low-income customers.[ii]

## IMPORTANCE TO WATER RATES

Conservation pricing provides a price signal to customers to use water efficiently, and can be achieved through a variety of volumetric rate structures. Volumetric rates charge customers per unit of water used and can be structured in several ways:

- Uniform rates in which the volumetric rate is constant regardless of the quantity used.
- Seasonal rates in which the volumetric rate reflects seasonal variation in water delivery costs.
- Tiered rates in which the volumetric rate increases as the quantity used increases.
- Budget-based rates in which the tiers are based on individual customers' water use and the respective volumetric rates are based on the utility's water delivery costs.[iii]

Conservation pricing is often applied to manage a customer's demand for water by pricing discretionary water uses (such as landscape irrigation) at a higher rate than water used for basic human needs (such as drinking water and sanitation).

Despite many advantages of conservation pricing, there can be challenges. For instance, rates can go up after conservation programs are instituted, and customers may perceive these rate increases as punitive: they are being charged higher prices after "doing the right thing." In addition, water managers frequently cite the potential for revenue volatility as a top concern related to adopting conservation pricing. As consumers use less water, revenue may decline. If the water service provider is not charging the customer the amount that each additional unit of water costs to provide, this can lead to revenue instability. There are several strategies that can be implemented to address these concerns, described below.

# STRATEGIES FOR SUCCESS

## Demand Forecasting

Developing robust forecast scenarios of future water demand is critical to understand how implementation of conservation and efficiency measures, as well as long-term expected changes in the population and economy, will impact water sales revenue. Demand forecasters should consider incorporating a range of explanatory variables and the impacts of price effects into forecasts (see accompanying "Water Rates: Demand Forecasting"). Short-term forecasting is useful for revenue and rate-setting purposes, particularly when instituting conservation rates, which can introduce more revenue volatility.

## Rate Stabilization Funds

Rate-stabilization funds are a type of financial reserve that can buffer the impacts of occasional revenue shortfalls. Decreased water sales, and the associated reduction in revenues, can occur for a variety of reasons, including cool temperatures, wet weather events, mandatory drought restrictions, an economic downturn, and increased conservation and efficiency. Reserve funds can help ensure fiscal solvency during such times, and can be particularly useful if rates are steeply tiered and therefore more sensitive to changes in water demand.

## Finance Policies

Finance policies can provide the guidance necessary for water service providers to quickly and easily respond to revenue shortfalls. Numeric targets can be set for a variety of financial metrics including credit ratings, debt service coverage, cash financing, and reserve balances.[iv] It is especially useful to develop financial policies that provide the Board and staff with guidance on how to set up and operate reserve funds. For example, the Contra Costa Water District's Reserve Policy describes 12 different Board-established reserve funds, including: rate-stabilization, future water supply, seismic upgrades, Clean Water Act compliance, and drought contingency funds. The rate-stabilization reserve fund policy, in particular, states how the fund should be managed to limit rate increases associated with the construction of new water supply infrastructure.

> "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."[v]

Setting quantitative targets for when to withdraw reserve funds and how to apply them can establish clear expectations for their use. Additional examples of financial policies are provided below:

- City of South Pasadena Financial Policies: http://www.ci.south-pasadena.ca.us/finance/policies.html
- Rancho California Water District's Debt and Financial Policies: https://www.ranchowater.com/files/policy_debt.pdf
- San Diego County Water Authority Long-Range Financing Plan: http://www.sdcwa.org/sites/default/files/files/longrangefinancingplan.pdf
- City of Sacramento Financial Policies: http://www.cityofsacramento.org/utilities/media-room/documents/FCSSacramentoUtilityRateReport033111.pdf
- City of San Diego Reserve Policy (for the city as whole, search the term Water for specifics): http://www.sandiego.gov/fm/pdf/reserve_policy_revised.pdf
- Interview with Orange Water and Sewer Authority's Director of Finance: http://www.youtube.com/watch?v=-jJH9FOfDco
- Case Study: Birmingham, Alabama: http://efc.web.unc.edu/2012/08/01/the-success-story-of-one-water-utilitys-financial-policies

## Marginal Cost Pricing

Saving water usually saves money, as conservation means avoided operation and maintenance as well as new infrastructure costs. This is why many economists recommend marginal cost pricing: it rewards individual customers for conservation and efficiency in a way that does not burden or benefit other customers.[vi] Marginal cost pricing is simply setting the *price* of a unit of water to equal the *cost* of supplying (or saving) an extra unit of water. The goal of marginal cost pricing is to allocate goods in an economically efficient manner that serves to alert customers about the cost of using (or not using) an additional unit of water, so that usage can be adjusted accordingly.[vii]

Yet, marginal cost pricing can be complicated to implement. Calculating the marginal cost can be data-intensive and requires accurately forecasting future demand and estimating the cost of new capacity or supply.[viii] Moreover, in some cases, marginal cost pricing can fail to send the proper signal when bundled with other services, such as wastewater and refuse collection. In other cases, marginal cost pricing can lead to unaffordable water when the next available water supply is extremely expensive. Nevertheless, when water prices approximate marginal costs, revenue stability will be greater as prices more closely match actual costs.

## Budget Based Water Rates

Water budget rates are a relatively new innovation, and California Assembly Bill 2882 (2009) helped pave the way for broader implementation.[ix] Under this structure, individual customers are charged for water using increasing tiers, where the tier breaks are unique to the customer. The first tier(s) is set to represent the "base use" for a household according to the unique characteristics of that property. This can include number of occupants, lot size, and local climate. Customers can apply for variances, so that a household with additional water needs can have those needs incorporated into the base use calculation. As long as the user is efficient in their use and communicates effectively with the utility, they will not be penalized for having needs beyond that of other customers.

Proponents argue that water budgets are equitable because they are based on individual household needs, with excessive use beyond the budget penalized with a higher rate. An advantage of this rate structure is that it can be structured to stabilize utility revenue, if fixed costs are recovered in the base rate. In this case, excess revenue collected in penalty tiers can be used to fund conservation programs. Criticisms of this rate

structure cite the difficulty of initial data collection and maintenance, which can be particularly burdensome for a small utility without in-house expertise or adequate financial resources. Moreover, for the rate structure to work effectively, customers must directly communicate with the service provider about their living situation and personal habits, which can be viewed as intrusive. In addition, water budget allocations based on discretionary uses can be perceived by other customers as inequitable. For example, exemptions granted for large, water-intensive landscapes or larger lot sizes could be considered inequitable to those customers who have chosen xeriscaping or have smaller lots, but the water supplier can adjust the irrigated acreage amounts as a matter of policy. The most well-known example of a water budget based rate structure is Irvine Ranch Water District's; however, there are 28 others nationwide.[x]

## Ongoing Customer Education and Communication

Water service providers should have an official communications strategy on all matters related to water service, water quality, and cost (see accompanying "Water Rate Recommendations: Communication and Education"). A good communications strategy is especially critical when a water service provider is proposing rate changes, particularly since water pricing can be difficult to both explain and understand. When implementing conservation rates, it is particularly important to address the customer perception that they are paying more for using less. A good communications strategy explains that increases in water rates do not always mean increasing costs for all customers, as the water bills for efficient households may stay the same or even be reduced with conservation pricing. In addition, water is a rising cost industry as a result of expanding regulations, deteriorating infrastructure, as well as increasing operations and maintenance costs. Therefore, the cost for water will increase regardless of conservation pricing. And finally, although water rates may rise in the short term, conservation pricing is meant to reduce the long-term costs associated with accessing new supplies, such as costs for building more water supply and treatment infrastructure. If the next available supply is relatively expensive, such as desalinated water or imported water, then water rates should accurately reflect the high marginal cost of those additional water supplies.

## ENDNOTES


[i] Urban Water Management Planning Act, 1983 and as amended. Accessed online at: http://www.water.ca.gov/urbanwatermanagement/docs/water_code-10610-10656.pdf
Alliance for Water Efficiency. The Water Efficiency and Conservation State Scorecard, 2012. Accessed online at: http://www.allianceforwaterefficiency.org/final-scorecard.aspx
[ii] Southwest Florida Water Management District. Not dated. Water Rates: Conserving Water, Protecting Revenues. Accessed online at: http://www.swfwmd.state.fl.us/conservation/waterrates/
[iii] California Urban Water Conservation Council, BMP 11.
[iv] Water Research Foundation. 2011. Financial Management Strategy Bulletin 1: Internal Financial Policies (Metrics-driven financial policies).
[v] Contra Costa Water District. 2011. Contra Costa Water District Reserve Policy. Accessed online at: http://www.ccwater.com/files/ApprovedReservePolicy.pdf
[vi] Wolff, G. 2003. In: Waste Not, Want Not: The Potential for Urban Water Conservation in California. Pacific Institute: Oakland, California.
[vii] MacEwan, D., M. Garcia, and C. Norris. 2006. Final Report: Integrating Marginal Cost Water Pricing and Best Management Practices. California State University, Long Beach.
[viii] American Water Works Association (AWWA). 2000. Principles of Water Rates, Fees, and Charges. Manual M1. AWWA: Denver, Colorado.
[ix] Hildebrand, M., S. Gaur, and K. Salt. 2009. Water Conservation Made Legal: Water Budgets and California Law. Journal AWWA 101(4): 85-89.
[x] Water Research Foundation. 2008. Water Budgets and Rate Structures--Innovative Management Tools, Project 3094. Accessed online at: http://www.waterrf.org/Pages/Projects.aspx?PID=3094