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The Pendulum Swing

of Revenue Stability and Conservation

Conservation water rate models are not producing the revenue that they had forecasted in this new economy. As a result, many utility managers are faced with lower-than-expected water demand, which, in turn, has created a significant reduction in the revenue required to meet operational needs. The crisis is the imbalance between revenue stability requirements and water conservation objectives. The remedy to this serious issue requires a broad understanding of the unique factors that make up a utility's water demand and revenue characteristics. The steps required to quantify these factors include reviewing possible internal adjustments, conducting studies and scenario testing, tracking and monitoring trends, developing risk mitigation tools, and promoting community education and outreach.

THE PENDULUM EFFECT

Each utility has a unique set of factors that affect the pendulum swing between revenue stability and conservation. These factors include rate structures, rates, water use polices and expectations, billing and collections procedures, conservation programs, financial policies, fiscal targets, and approval processes, all of which combine to create a complicated revenue-generating machine. Revenue generation is subject to many changing variables. These variables represent a significant pressure or force on the overall revenue forecast model. The main forces on the model include the most common goals of revenue stability, equity and acceptance among customers, and conservation pricing. In the past decade, conservation rate structures and pricing were the prominent forces during a robust economy—but now concern over revenue stability is beginning to push back. The new pendulum swing is occurring because water use restrictions, conservation programs, and conservation rates resulted in a sustained lower level of water demand and therefore less water sales revenue.

Less revenue creates financial pressure to cut costs or raise rates by reducing or delaying improvements and maintenance, however, costs may actually increase in the future, i.e., pay now or pay even more later. Another option is operating the utility in a more financially weakened condition but this could create a downgrade in credit and increase the cost of future borrowing. Other political, legal, and economic forces also exist. For example,

most approving authorities will not allow a utility to increase rates to make up for a loss of revenue from conservation (Wang et al, 2005).

The historical swing. The pendulum's original position of revenue stability included traditional fixed rates when water accounts were unmetered and uniform rates were applied to all customers. Billing systems were not technologically advanced, and therefore rate designs were very simple. Revenues were predictable because the change in the number of customer accounts was the main variable. Water was cheap and plentiful, and everyone seemed happy. The pendulum then started to move the other direction through the forces of water scarcity, the introduction of water meters, and the public education about water's true cost, conservation, and new rate designs (Wang et al, 2005). Uniform rates for residential customers shifted to inclining-block rate structures, through which high-volume water users were charged more in an effort to provide customers with an economic incentive to conserve (Raftelis et al, 1992). In addition, various new conservation rate structures were considered to meet the goals of the utility (Teodoro, 2002).

In *Principles of Water Rates, Fees, and Charges,* rate-making experts cautioned, "From a utility's standpoint, both revenue stability and equity are generally enhanced as appropriate types of costs are recovered through fixed costs. The significance of this enhancement depends on several variables unique to each utility's customer base and overall fiscal tools. Also, it is commonly accepted that as a utility increases the fixed fee component of the rate structure, it decreases, to some extent, customers' ability to control the size of their bills. This relationship needs to be considered as utilities become more active in trying to affect demand through price signals" (AWWA, 2000).

Cost allocation shifts from fixed-cost revenue. The reliance on 100% fixed rates revenue has shifted to only a small percentage of total water sales revenue (less than 20%). Today's new low monthly fixed charge is based on customer-related costs (billing and customer service) and meter charges based on size. All other costs, using various complicated allocation formulas, were tied to volumetric (consumption-based) charges based on average consumption. The allocation of costs (such as debt) to a consumption charge significantly weakens the financial stability of the utility. As noted in *Principles of Water Rates, Fees, and Charges* (AWWA, 2000):

> The fixed and variable charge for cost recovery in a cost-of-service water rate analysis is not the same as recovering fixed and variable costs from an accounting standpoint. Accountants define fixed costs as costs that do not change in total as the volume of activity changes. Variable costs are costs that do change in total as the volume of the activity changes. However, in a cost-of-service water rate analysis, these definitions do not necessarily apply. For example, debt service incurred for a new treatment plant is fixed from an accounting standpoint, but debt service is also related to consumption because the treatment plant treats water that customers demand. Based on cost causation, this cost is recovered from a consumption charge.

Revenue recovery, as a result, became more unstable because it was subject to any factor that could affect water demand. These factors included weather, voluntary or mandatory water restrictions, the introduction of water-saving devices, the consequences of price signals that caused customers to reduce their water use to maintain a consistent household water budget (price elasticity of demand), and, ultimately, a downturn in the local and national economy.

Affordability creating a push back effect. A downturn in the economy would typically have had about the same effect on water demand as soaring prices at the gas pump had on residential household budgets, and the impact would have only been considered short term. Today, utilities not only face exposure to normal risk factors (e.g., variables such as weather, growth, conservation) in their revenue projections, but they also face the added destructive ingredient of a decline in personal incomes. The decline in personal household income, combined with a prolonged downturn in the overall economy, has raised the issues of utility rates and affordability for customers (SUA, 2010). The question utility managers and policy-makers at all levels of government are struggling with is whether rates can be raised to pay for operations, capital improvements, and replacements and still be affordable to customers (Baird, 2010).

Additional factors influencing the swing. First, most financial forecasts assume a level of inflation that increases every year. Embedded into this assumption is the belief that salaries and wages would also increase for the community as a whole, allowing consumers to keep up with inflation and offsetting many future rate-affordability concerns. However, the rampant rise in unemployment, decrease in consumer confidence, unstable worldwide financial markets, and large US debt have resulted in a significant decline in personal household income. This decline has prompted antitax groups to add ballot measures that will decrease state and local tax burdens. This movement has incorporated the same attitude toward utility rates as it has toward taxes, making it more difficult to increase rates.

Second, many utilities understand that their access to low-

interest-rate funding for needed capital projects means maintaining adequate credit worthiness. Incorporated into master bond agreements and other bond documents are legal requirements that demand a utility adjust rates as necessary to run the operation and make debt service payments while maintaining various financial metrics, including a debt-coverage ratio (Raftelis, 1993).

The prescribed debt-coverage ratio, which ranges from 110 to 125% of net income (revenue less expenses as a percentage of annual debt payments), and a targeted minimum 25% operating reserves are remnants of the older fixed-charged revenue assumptions. They have not been adjusted to accommodate the newer conservation rate structures with declining revenues over time or the increasing burden of infrastructure replacement programs. As a result, more pressure is applied to just increase rates without considering affordability. These past financial indicators seemed adequate and could even be considered lenient—especially if growth revenue is included in the net income calculation. Credit agencies and bond holders decided to not impose more stringent bond ratios because the number of utility defaults on debt payments was traditionally very low. In the past a utility would always purchase bond insurance to raise the credit score of the issued debt to a AAA status, which seemed to make up for any underlying financial weaknesses resulting from the rate structure and revenue recovery. However, in the new economy, this option is less available and more expensive (Baird, 2010).

Understanding the laws of motion on water demand and revenue generation. Each utility is unique, considering all of the forces that can affect how the pendulum swings. Each utility has a different set of officials and customers, each of which has his or her own perceptions and policy interpretations regarding stability, equity, and conservation. The commonality for utility managers is the challenge that each must develop a process and a strategy to navigate the many policy-related discussions that affect a utility. It is a new requirement of twenty-first-century utility management to be more aware of customer service expectations, more transparent in business transactions, and more diligent in defense of community water requirements in both the short and long term (AWWA, 2001).

Utility managers need a collection of materials to have coherent policy discussions. This requires data to be gathered and analyzed and transformed into a reviewable format. These materials can be used to explain the potential short- and long-term effects of revenues and water demand in order to make informed policy decisions.

A UTILITY MANAGER'S ACTION ITEMS

The steps to gather the information required for the internal and external policy negotiations fall into five major areas: (1) reviewing possible internal adjustments, (2) conducting studies and scenario testing, (3) tracking and monitoring trends, (4) developing risk-mitigation tools, and (5) promoting community education and outreach.

Review internal budgeting and accounting adjustments. Managers should make sure all possible operational and salary costs that contribute to capital projects are capitalized on an annual basis (Gauthier, 2008). This correctly moves true capital-related costs out of the operational expense side and improves the overall debt-coverage ratio.

Managers need to protect the utility's human capital (Westerhoff et al, 1998). As Chesnutt and colleagues noted in 1996, "Some water agencies have been forced to adopt a defacto coping mechanism that lies on the cost side—deferring capital investment, laying off personnel, or avoiding expenditures for [preventive] maintenance. Such involuntary adjustments can disrupt the capability of the water utilities to provide reliable, high-quality water service. Crisis-driven cutbacks can be avoided if rate design correctly hedges for revenue certainty."

There may also be flexibility renegotiating transfers outside the enterprise fund. This would include reviewing the cost allocation methodology used to transfer monies out of the utility enterprise fund to the general fund for municipally owned utilities. Also as noted in *Principles of Water Rates, Fees, and Charges*, "Transfers from the general fund of a government-owned utility to fund debt service or O&M [operations and maintenance] expenses are not considered to be adequately financed, self-sustaining enterprises."

For a knowable, future one-time large operational expense—after checking with external auditors—approved accounting treatments could be applied to set aside funding today.

Conduct studies and scenario testing. Utilities should issue a request for proposal for rate analysis that develops a partnership, not just a final report. For evaluation purposes compare the experience of both the firm and the project lead and set the estimated hours of effort over a budget year, and compare 70% of the total hours of the project at the project lead's hourly rate to evaluate the estimated costs. Also, consider a two-to-three year contract-extension provision.

Utilities need to understand what it costs to serve each customer class as well as the water use characteristics of each customer class (AWWA, 2008). Updating a cost-of-service study is also an important activity to do every two to three years to ensure that cost allocations are still accurate. As noted in *Principles of Water Rates, Fees, and Charges*:

In designing rates, a utility has many objectives to balance. These objectives may have distinct implications on the type of fixed and variable charges that a utility develops. A cost-of-service approach to setting water rates allocates costs to each customer or customer class based on the theory of cost causation. A dual set of fees—fixed and variable—is an extension of this cost causation theory. Cost-of-service rate designs often include a fixed and a variable charge. The fixed charge in a rate design may take many forms, but this portion of the customer's bill will be the same, or fixed, for each bill regardless of the amount of water the customer uses. Variable charges, often referred to as consumption charges, are rates applied against the amount of water a customer uses. This portion of the customer bill varies with consumption.

Utility managers should review the current rate structure and design against simulations (scenarios) of different variables (sensitivity testing) with revenue projections as the outcome (Chesnutt, 1996). Among Denver-area municipalities along the Front Range in Colorado, weather alone can change baseline revenue projections by 8–12%, as experienced in 2009 when very wet weather occurred during the irrigation season. Also, higher water rates and conservation efforts have sent a price signal to consumers that has fundamentally shifted the start of the noticeable irrigation season from April to May/June.

Make sure to model the effects of shifting annual debt-service payments and payroll to the monthly fixed-charge amount over time while keeping the total annual bill level. Pay close attention to the effects of the monthly and overall annual bill for low-volume users and low-income households. Policy adjustments to a strict cost-of-service approach may be necessary based on the overall findings—especially if low fixed-cost charges are driving higher future rate increases to mitigate revenue recovery and credit risks.

Avoid minimum charges in which the fixed fee includes an allotment of water consumption. Utilities often assume that a minimum charge adds to the utility's revenue stability; however, the consumption level is normally set so low that there is little benefit (AWWA, 2000).

Study the price of elasticity demand for your community. An important factor in being able to manage metered water effectively is knowledge of its price elasticity of demand. Compare findings with nearby agencies and national studies.

Track and monitor trends. Utilities should develop a data warehouse to analyze and review historical trends (10 years) and the relationship of various variables such as consumption, weather, conservation restrictions, growth, and revenue generation by customer class.

Citywide statistics may not offer the data required to understand the rate impacts to disadvantaged suburbs. It may be helpful to track and monitor rate affordability effects as a percentage of median household income by major demographic areas as part of the financial model. An analysis of the impacts of subdividing the residential customer class for cost causation and affordability concerns should also be considered. A very important aspect of tracking and monitoring the potential impacts to your credit standing includes building a financial ratio module as part of a 20-year financial plan (SUA, 2010).

Develop risk mitigation financial policies and tools. It is always helpful to include the financial advisor when developing risk mitigation tools. Consider hiring a qualified financial advisor, or at least get a second opinion on financial options (PFM, 2010). Adopting financial policies with minimum and maximum financial targets helps offer a financial framework to operate the utility (Westerhoff et al, 1998). Risk-mitigation strategies such as a rate-stabilization account or possible bond-defeasement plan are short- and long-term strategies to mitigate against heavy swings in revenue or debt. Consider maintaining a debt-payment-contingency reserve fund equal to an annual debt-payment amount, and invest this money and use the interest income as a long-term revenue source. Low-income assistance programs should be reviewed and analyzed to consider options to best address the weaknesses of the revenue recovery under different modeling scenarios (Water Research Foundation, 2010).

Promote community education and outreach programs. Utility managers should discuss and develop community goals on balancing revenue stability with equity and conservation as part of the community outreach and conservation programs (Westerhoff et al, 2003). Other outreach efforts should include: creating a citizen's advisory group on such long-term issues as aging infrastructure replacement and asset management to develop advocates and expertise within the community; building a relationship with the editorial board of your local newspaper by meeting on a semiannual basis and discussing trends, challenges, successes, and recommendations; setting up a web page for improved communication with credit agencies and bond holders. Customer feedback surveys on customer service interactions is also an important tool to monitor perceptions for community outreach and conservation programs and policy adjustments (Water Research Foundation, 2009).

BEHIND THE RATES

It is all about rates, but the published rate schedule that councils and boards review and approve and that citizens pay is more than just a dollar amount. The work and challenge of learning the complicated processes of the business of water and the endless political journey of

educating citizens stand paramount behind the simple table of rates. In order to balance the competing and changing objectives—like forces on the swing of a pendulum—utility managers must continue to review, revise, and establish policies and practices that ensure the sustainability and financial stability of the utility enterprise. Managing this continuing improvement process effectively is what will ensure that utilities will successfully survive the challenges of conservation pricing, regionalization and consolidation, climate change, new metering technologies, watershed protection and sustainability, coordinated water and land use planning, aging infrastructure renewal and replacement, and affordability.

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