Full-Cost Water Pricing

Background

Historically, many utilities have based their water rates on the operation and maintenance costs of water treatment only and have not been able or willing to include the cost of the replacement of the water treatment, storage and distribution systems. Those replacements will come in future years. While this method has resulted in lower water rates for the system's customers, historically, water rates have not acknowledged the full-cost of providing water service. Water systems, like all other man-made systems, have a useful life expectancy. Water system management must incorporate the cost of upgrading, maintaining and replacing this infrastructure into their water pricing.

Full-cost pricing is when the water system ("utility") charges customers for the actual cost of water service, including explicit recognition of the level of reinvestment needed on an on-going basis to refurbish, replace or upgrade existing assets. This will guarantee the utility the revenue needed to cover at a minimum the costs of operation, treatment, storage, distribution and for past and future investments. Full-cost pricing is a pricing structure for drinking water and wastewater service, which fully recovers the cost of providing that service. Full-cost pricing should be implemented in an economically efficient, environmentally sound and socially acceptable manner. Full-cost pricing should also promote efficient water use by customers.

Water systems must base their rates on the true costs of providing water in order to have the resources available for proper system maintenance and to pay for current capacity as well as future upgrades and replacements. Availability of state and federal funds to assist with this work are limited, therefore utilities must be prepared to fund these upgrades and replacements using their own resources. The sooner a system's water rates are based on full-cost pricing, the sooner the needed upgrades and replacements can be completed. With proper planning, the work can be completed prior to any major system failures. This planning should not only prevent system failure, but also prevents sudden, major rate increases in the future that would be needed to repair the failing systems.

Full-cost pricing:

- Is essential for sustainability and economic efficiency; accurate pricing encourages efficient production and use.
- Ensures rates are sufficient and that there is a stable source of funds and reserves.
- Ensures a water system's financial health, enabling the utility to provide safe water now and in the future.
- Provides better information to customers on the total costs of water service, and the true value of the product they are purchasing.
- Helps customers recognize the value of the service and be more aware of

their water use.

According to North Carolina's 2008 Drought Bill (Session Law 2008-143), Section 9-G.S.143-355.4(b)(1), water rate structures should be adequate to pay the cost of maintaining, repairing and operating the system. That includes reserves for payment of principal and interest on indebtedness incurred for maintenance or improvement of the water system during periods of normal use and periods of reduced water use due to water conservation measures. In addition, water rates should be sufficient to pay for future capital costs, whether up-front or through debt service of future loans.

Once the full-cost (the true cost of providing water) has been established, the next step must be to determine how this cost will be distributed to the system's customers. Often the cost of water has not been established at a level that encourages the efficient use of available water. In fact, in some cases the use of decreasing block rates have actually resulted in less incentives for water conservation.

Applicability

This BMP is intended for all water systems wishing to recover the full-cost of supplying water to their customers and to send price signals to customers that will encourage water conservation. A water system may have already accomplished this BMP if it currently has a price structure that recovers the true cost of supplying water.

Description

Full-cost pricing is the use of rate structures to provide for the financial security of a water system. Using this BMP, water systems should consider establishing rates based on the revenue requirements of the system based on specific consideration of the level of investment needed to maintain, refurbish, replace and upgrade the existing assets to preserve the long-term capacity and efficiency of those assets or the cost of adding the next unit of capacity to the system. An established cost of service methodology should be followed whenever rates are developed or proposed for change.

This BMP addresses pricing structures for retail customers. For water systems supplying water and sewer services, the principles contained in this BMP can be applied to the pricing of both services. Water systems that supply water, but not sewer service should make good faith efforts to work with sewer agencies so that sewer services are not provided using a pricing structure that conflicts with the objectives of the water pricing structure.

For full cost pricing structures to be effective, customers must be educated on the reasons for the system's rate structure. An explanation of the rate structure should be included with each customer's water bill.

Determining Full-Cost Pricing

Full-cost pricing for water utilities is based on the cost of maintaining, repairing and operating the system. This pricing includes reserves for payment of principal and interest on indebtedness for the maintenance or improvements, and future capital expenses such as expected debt service. Essentially, full-cost pricing is an effective way to achieve long-term sustainability, and if done correctly, can address equity concerns, provide increased financial flexibility and stability, can be more cost effective over the long term, and can provide better cost justification for tiered rate structures.

There are many ways to account for your system's costs. You should pick one that works well with your current accounting system and that supports the rates you plan to use. Any approach must fully account for all costs related to the provision of water. To estimate these costs, review records of the last year's expenditures and account for changes to operating costs and capital projects expected to be completed during the next five years to twenty years. All utilities should create a capital improvement plan that estimates future capital costs in each year for the next five years to twenty years, and incorporate it into full-cost pricing. A ten to twenty year capital planning horizon is good, but financial planning should take into account, but be limited to a five year forecast. Beyond five years, any rate or financial forecast is typically unreliable, at best.

Cost components are calculated annually, and can be categorized into three different areas: personnel costs, non-personnel costs, and capital reserves (debt service set-aside and reserves for future capital costs).

Personnel Costs:

- Salaries and wages for administrative and operations and maintenance personnel.
- Labor costs for services required in the operations of the system including:
    - Treatment
    - Monitoring
    - Maintenance
    - Testing
    - Meter reading and billing operations
    - Customer Service
    - Legal and Accounting
    - Engineering, if applicable
    - Management
    - Benefits for personnel including:
        - Medical Insurance
        - Retirement
        - Vacation
        - Bonuses

Non-personnel Costs:

- Cost for office operations including:
    - Space rentals
    - Mortgages
    - Office supplies
    - Computer and lab equipment
    - Contracts
    - Cost for utilities including:
        - Electricity
        - Natural Gas
        - Communications
        - Water purchased from other systems

When estimating future utility costs and revenues, you will likely need to forecast the total annual water use. Examine your billing data to determine the total annual sales as well as your records for water withdrawals each year to predict future demand.

- Other direct costs to operate the system including:
    - Chemicals
    - Leased equipment
    - Routine maintenance and repair costs at facility sites, and for equipment and vehicles
    - Insurance costs covering buildings, vehicles, and personnel.
    - Costs for professional services such as accounting, legal and engineering if not done in-house
    - Permitting costs
    - Costs for career development and certification renewals for personnel.
    - Costs for residuals disposal
    - Costs for security and surveillance

- Indirect costs to operate the system including:
    - Transfers to the City or County for financial, personnel or other services provided

Capital Reserves and Debt Service Payments:

Sufficient revenue must be allocated to make principal and interest payments on current and future indebtedness, and for capital expenses that will be paid in cash. Debt service excludes mortgages, but covers investments for capital projects needed to maintain the safe operation of your system. The timing of investing in system assets is an integral component to determining sufficient reserves, and should be addressed in your Capital Improvement Plan. Projects for which capital reserves and debt service set-asides should be allocated can include:

- Rehabilitation and replacement of existing assets, including pipes, pumps, control systems, tanks, etc.
- Expansions and upgrades of the treatment and distribution systems.
- Interconnections to other systems.
- Source water development and protection.
- Any other interest owed by the system.

Managing system assets should be addressed in your Asset Management Plan. Asset management can be a lengthy process. It involves following five steps that will help you determine how much money should be placed in a reserve fund each year. Asset management is a part of your Capital Improvement Plan. The five steps are to:

- Develop an inventory of all of your assets by listing them and collecting information on the condition, age, service history and useful life of each one.
- Prioritize your assets to help you decide how best to allocate your limited resources. Priority should be based on the asset's importance (“criticality”) to the operation of your system and the protection of public health. Other factors to consider include how soon you will have to replace the asset and whether other pieces of equipment can perform the same function (redundancy).
- Determine the costs of asset rehabilitation and replacement, which should include an analysis of both capital cost and life cycle cost.
- Decide what percentage of these costs you will cover with cash (i.e., money you set aside in the reserve account), and how much you will cover through debt. In some cases, it may make more financial sense to borrow money to cover the initial cost of the project and pay those costs over a longer period of time, even with interest payments.
- Review and revise your plan. Your Asset Management Plan should be used to help you shape your Capital Improvement Plan. It should evolve as you gain more information and as your system’s assets and utility’s priorities change.

Following this process will help you determine how much money must be generated through water rates to fulfill your capital improvement plan.

Determine the costs associated with operating, maintaining, rehabilitating, replacement, upgrading, expanding and repairing your system. Then, tally those costs to determine the full-cost pricing of water. These full cost data should be reviewed annually and adjustments made to future budgets as appropriate.

Determining Revenue Requirements:

After determining your costs, you will need to calculate how much revenue you collect each year to offset these costs. Revenue sources can include:

- Water sales
- Fees and service charges
- Tap or connection charges

- Interest
- Grants
- Transfer payments from other funds (this practice is not recommended for any public enterprise fund)
- Private investments
- Other sources

Now that you have a better sense of your costs, revenues and reserves, you are ready to determine how much revenue will be needed from customers each year to cover any shortfalls. To cover the full cost of doing business (i.e., to meet the goals of full-cost pricing), the amount of revenue that you receive from your customers should equal your total annual costs including your annual debt service payments minus any subsidies or transfer payments you receive.

Required Customer Revenue = (Total Annual Costs) – (Subsidies) – (Transfer Payments) – (Other Revenues)

You will need to calculate your required revenue annually, taking into account your budget for the upcoming year. In addition, you will need to think beyond your needs for the next year. Variable costs, changes in subsidies, debt service costs, and other factors can affect your required revenue from year to year. Estimating costs for the next several years based on your fixed costs, operating expenses, asset rehabilitation and repair needs, and existing debt service can help avoid a significant gap between future revenue and costs. Once you have a better idea of actual costs, you can revise your estimates accordingly.

Now that you know your costs and the amount of money you need to collect from your customers to fully cover those costs, you are ready to start thinking about how you are going to collect this money. One way is through setting appropriate rates for water used by your customers that will account for your full cost.

Implementation

Full-cost pricing is best introduced over time and in multiple steps. Some of these steps include:

- Evaluating all the costs associated with the utility and incorporating adequate accounting programs.
- Implementing reporting procedures.
- Monitoring and documenting usage patterns for various sectors of users.
- Educating consumers on the value the utility provides.
- Planning for reserves necessary to fund the maintenance and upgrades required.
- Planning for the future and forecasting revenue requirements.
- Determining the actual cost of service.

- Implementing an Asset Management Plan.
- Evaluating and optimizing all aspects of the system (treatment, operations, metering, billing, distribution, debt instruments, etc.).

A rate structure that allows the utility to be self-sustaining is a balanced approach to utility management. Given the constraints discussed above, the structure of cost-based rates will vary by community. In the long run, full-cost pricing is imperative for every utility.

Successful adoption of a new rate structure may necessitate developing and implementing a public involvement process in order to educate the community about the new rate structure. The new rate structure should adhere to all applicable regulatory procedures and constraints. If the conservation pricing structure to be implemented is substantially different from current practices, then a phased-in approach may be appropriate.

Public involvement in the development and implementation of rates can help assure that the goals of the full-cost pricing initiatives will be met and accepted by local constituents. Public meetings, advisory groups and public announcements are among ways to generate public involvement.

Schedule

Water systems pursuing this BMP should begin implementing it at the earliest possible date. Although the implementation of full-cost pricing will likely have a significant impact on a system's water rates, phasing in this change can avoid more severe impacts on the system's customers. Improper planning will result in system failures and the inability to provide an adequate and safe water supply. When this happens, utilities may be forced to implement water rates that far exceed those that could have been implemented earlier with sufficient planning.

The implementation of full-cost pricing will take a major commitment by the system's management and its customers. The easy path is to continue to ignore the problem and leave the pending system failures and resulting major rate increases for others.

The key to full-cost pricing is to explain the need for the proposed rate structure and the consequences of inaction. The educational process starts with the system's management and staff and then quickly moves on to the system's customers.

Scope

To accomplish this BMP, the water system must determine the full cost for the operation of the system and set water rates at a level to help meet these current and future needs. Management must also maintain these funds for their intended purposes and not divert them for other needs.

Documentation

To track this BMP, the water system should maintain the following documentation:

- A copy of its legally adopted rate ordinance or rate tariff that follows the guidelines of this BMP.
- Billing and customer records that include annual revenues by customer class and revenue derived from commodity charges and fixed charges by customer class for the reporting period.
- A copy of the education materials on full-cost pricing sent to customers for each calendar year this BMP is in effect.
- An account of all system costs.
- An Asset Management Plan, last updated within the past two or three years.
- A Capital Improvement Plan, last updated within the past two or three years.
- A water system bill meeting the parameters and schedule in the Schedule Section.

Other Considerations

While Full-Cost Water Pricing is a valuable tool to help ensure that the utility will have adequate water available for all its customers, the utility must also ensure the rates are adequate to cover the day-to-day operation of the water system and the system's long-term system repairs or replacement.

The June 2012 Journal of the AWWA, contained an article by H. Edwin Overcast titled "Is it time for water utilities to rethink pricing?" In the article, Overcast discussed how utilities face declining per capita consumption as a result of conservation measures, unpredictable weather patterns, and implementation of increasing-block rate structures. Faced with generally declining use per customer, water utilities are confronted with the unfortunate fact that revenues may not be sufficient to cover the costs of operation, maintenance and debt service needed to keep the system of reservoirs, treatment plants, pumps, pipes, valves, fire hydrants and meters running.

One solution Overcast discusses is recovering fixed capital cost associated with local infrastructure (distribution system-related fixed cost) through fixed monthly charges and recovering traditional volumetric-related costs through volumetric charges. This option, called straight fixed-variable rate design has been adopted by other types of utility providers. Shifting customer costs from volumetric charges to fixed charges would likely need to be phased in over several years in order to mitigate the impact of such changes on the bills of the smaller-volume users.

For comments or questions regarding the full-cost pricing BMP, please contact the water efficiency specialist of the Water Supply Planning Branch at 919-707-9021.

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