INTEGRATED RESOURCE PLANNING AND INCENTIVE REGULATION

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INTRODUCTION

For state-regulated investor-owned utilities, integrated resource planning is not easily divorced from the issue of incentive regulation (Beecher, et al., 1991 and 1994). Least-cost planning can and has been implemented under traditional rate base/rate-of-return regulation. Experience in this area is far more extensive for electric than for water utilities. However, a growing literature emphasizes the inherent limitations of traditional economic regulation, particularly in terms of providing performance and planning incentives. A frequently held view is that traditional ratemaking presents barriers both to cost efficiency and technological innovation (Bonbright, et al., 1988).

THE NEED FOR INCENTIVES

With respect to electric utilities, David Moskovitz points out that: (1) each kilowatthour a utility sells, no matter how much it costs to produce or how little it sells for, adds to revenues; (2) each kilowatt hour saved or replaced with an energy efficiency measure, no matter how little it costs, reduces utility revenues; (3) the only direct financial aspect of regulation that encourages utilities to pursue cost-effective conservation is the risk that dissatisfied regulators may disallow costs; and (4) purchases of power from cogeneration, renewable resources, or other nonutility sources add little to utility profits, no matter how cost-effective they are. For their part, utility managers are motivated to pursue strategies that increase revenues, keep expenses down, and increase capital investments on which a return can be earned.

Thus, traditional regulation may incorporate substantial disincentives for some important aspects of integrated resource planning. For example, least-cost planning emphasizes providing utility services with the least-cost mix of supplies and efficiency improvements. However, even if cost-effective, conservation and demand management may add little to utility earnings and thus discourage utility managers from including these options in long-term plans. Incentive regulation can be used to help overcome this problem.

Incentive regulation in general consists of innovative regulatory approaches designed to provide utilities with incentives to achieve specified performance goals or standards. Most incentive regulation programs that have been initiated or proposed have occurred in either the energy or telecommunications sectors. In many cases, incentives have been provided in a partially deregulated environment.

Each form of incentive regulation generally involves a mechanism by which utilities are induced to increase efficiency through a system of rewards and penalties. One form incorporates rates of return tied to cost performance while another form involves cost-of-service indexing. Another form incorporates price regulation, with the purpose of providing the utility with enhanced pricing flexibility. Yet another form consists of incentives for capital investment in demand management. Most forms, whether involving performance assessment or price caps replacing rate of return restraints, have the intent of promoting cost efficiency. Incentive regulation addresses the problem of cost control under traditional regulation. Incentive regulation can incorporate the yardstick or benchmark approach in which the performance of the target utility is evaluated on the basis of the performance of the same utility over time or through the use of an index or a control group of comparable utilities. These forms of regulatory innovation obviously can affect utility costs, rates, and quality of service. Some forms of incentive regulation can reduce regulatory costs, but this is not typically the case with demand management and conservation incentives.

DEMAND-MANAGEMENT INCENTIVES

Traditional regulation provides strong incentives for the utility to avoid conservation or demand-management investments. For example, investment in supply-side facilities generally is easier to recover than investment in conservation. Even when the conservation investment is

more efficient than either producing or purchasing the incremental supplies, cost recovery is easier for the supply-side investment. The bias against demand-side investment in traditional ratemaking is simple. With traditional regulation, short-term profit considerations motivate utility managers to increase utility sales; conservation poses the threat of revenue erosion, which in turn threatens earnings. If the utility installs conservation equipment on the premises of the ratepayer, it may be allowed to recover its capital investment (with a lesser possibility of a return on that investment) from ratepayers. However, the real savings from the conservation investment accrues to the ratepayer. Thus, there persists an incentive-driven bias toward meeting incremental demand by increasing supplies.

Because traditional regulation does not necessarily provide utilities with incentives to implement conservation and load management, a number of alternative ratemaking approaches have been proposed. The goal is to make cost-effective conservation and demand management at least as attractive an investment as supply alternatives. Some of the incentive mechanisms that have been proposed for use in promoting demand-side management by electric utilities include: shared savings, bonuses based on units saved, adjustments to overall rates of return and return on equity, mark-up on expenditures, ratebasing of demand management investments, an employee bonus pool, and various other cost recovery and revenue recovery mechanisms. Thus far, the application of these methods in the water sector is almost nonexistent. Their use, of course, would require commission approval.

State regulators have recognized the argument for providing utility incentives for conservation programs and other means of implementing integrated resource planning. According to Oregon Commissioner Myron Katz, treating conservation as a resource is an approach that provides utilities with incentives to invest in cost-effective conservation, achieves least-cost system objectives, is theoretically sound, and is fair to all ratepayers. In this view, allowing utilities to charge consumers for conservation services serves equity and efficiency policy goals.

Nevada Commissioner Stephen Weil has advocated several regulatory incentives for the utility to make conservation investment. One is to establish a revenue adjustment mechanism that insures that unexpected changes in sales volume do not affect earnings; this revenue adjustment mechanism would eliminate the short-term disincentive of potential revenue erosion with demand-side programs. Another regulatory incentive is commission allowance of both capital recovery and return on demand-side investment. Most state commissions permit both recovery and a rate of return on supply-side investment but permit only the recovery of demand-side investment as an operating expense. Allowing a rate of return on demand-side investment would provide equal treatment for demand-side and supply-side programs.

The incentives for demand management can serve either as an alternative to the construction or leasing of new capacity. Similar incentives could be designed to induce water utilities to develop automatic meter reading capability that could be marketed to other utilities. Incentives could be employed to induce water utilities to develop new services including maintenance services for water consuming equipment (for example, fire protection systems) and the marketing of both water-using and water-conserving equipment.

Most incentives are directed toward utility investors; that is, they provide ways for investors to earn a higher return on their investment. The logic behind investor incentives is that higher earnings are linked, in part, to demand growth. There is some limited evidence to suggest, however, that growth is not a necessary condition of profitability. According to one study, changing the corporate culture of public utilities may prove more essential to the adoption of demand-side management programs:

> There is a widespread misconception that limiting utility sales growth is bad for [electricity] utility investors. The evidence overwhelmingly contradicts this view. Limiting sales growth via [demand-side management] programs should not, therefore, be assumed to be financially unattractive to utility investors. Growth-limiting [demand-side management] programs may be unattractive to utility managers, however, because less growth could mean lower salaries and less power and prestige. The analysis suggests that the focus of [demand-side management] incentive programs should be on utility employees, not on the stockholders. The ultimate challenge for utilities and commissions is to find ways to change utility corporate cultures to be more supportive of [demand-side management].

Managers in the water utility industry have been as supply oriented as managers in electricity, and understandably so given the past abundance of water resources and the incentives provided under traditional regulation. In the

design of incentive regulation programs, therefore, it might be worthwhile to consider managerial incentives for adopting conservation and demand management along with incentives directed toward utility investors. It is particularly important that managers do not perceive the regulatory interest in integrated water resource planning as punitive in nature.

A number of incentives have been specifically designed to encourage demand-management by energy, and now water, utilities. These can be categorized as follows (Beecher, et al., 1994):

Cost-recovery mechanisms to improve revenue stability, reduce regulatory lag, and ensure that the utility would be able to promptly recover in rates all prudently incurred costs of demand-side programs.

Lost-revenue mechanisms that would adjust rates to compensate for the short-term loss in base sales, revenues, and profits that result from successful demand-side programs.

Performance-motivation mechanisms that provide bonuses (or penalties) for meeting (or not meeting) program goals to help offset the risks perceived by utility managers, and motivate utility shareholders to expand cost-effective demand-side programs.

The key variations of these incentives are provided in Table 1.

IMPLEMENTATION ISSUES

Demand management raises several implementation issues. Obviously, the selection of the reward mechanism (for example, rate of return versus management bonuses), the specification of how savings from demand-side programs are to be shared between the utility and its ratepayers, and regulatory treatment of demand-side investments relative to supply-side investments are the key regulatory issues. Other implementation issues are of a more technical nature, such as those relating to measuring the effectiveness of demand-management incentives.

Incentive regulation aimed at demand management provides the potential for cost efficiency but does not reduce regulatory costs as would incentive regulation aimed at pricing. The demand management incentive approach suffers an acceptability problem in the context of regulators being reluctant to provide parallel treatment for demand-side and supply-side investment. By contrast, there are no specific characteristics of water utilities that would hinder the application of demand management incentives to water utility regulation. Indeed, some demand management incentives may have more potential benefits in water than in other utility sectors.

The various incentive approaches need to be examined in the context of standard regulatory practice and operating procedures. The key issue is whether incentive regulation can improve the performance of water utilities under commission jurisdiction. As Dennis Goins indicates, the answer to this question is a function of answers to a set of other questions including:

Which aspect of water utility operations should the incentive approach be directed at improving?
How should performance of this operation component be measured?
Should performance be evaluated against an index group of similar utilities?
How should the utility receive the rewards and penalties associated with its performance?
What level of rewards and penalties is required to induce performance improvements?

Conceptually, incentive regulation approaches should be based on comprehensive performance measures to avoid the deliberate sacrifice of one performance dimension for another. The incentive approach should be easy to understand and reliable in achieving cost efficiency. The incentive approach should address only the aspects of utility performance under management control; it should avoid penalizing or rewarding for performance results beyond management control. An effective approach should provide a framework to promote efficiency through management decision making; that is, management must have appropriate and fair incentives to improve performance. The approach should provide signals to management to be efficient in both the short-term and the long-term, and not sacrifice long-term for short-term performance.

In brief, the incentive regulation plan must achieve a balance between predictability (to motivate performance) and flexibility (to accommodate changes in the environment). An effective incentive system must be redesigned and reevaluated constantly to allow for changing economic conditions, regulatory conditions, and risks. And if an appropriate level of regulatory oversight is to be maintained, incentive plans must avoid "giving away the store," even in the context of promoting integrated resource planning goals.

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TABLE 1
REGULATORY INCENTIVES FOR DEMAND MANAGEMENT BY INVESTOR-OWNED UTILITIES

General type of incentive	Specific type of incentive	Explanation
Cost-recovery mechanisms	Deferral to rate case	Deferral of accounting for variations in expenses until a subsequent rate case
	Flow through costs to rates	Accounting for variations in expenses through the use of an adjustment clause, surcharge, rider, or other ratemaking mechanism
	Modified cost accounting	Recovery streams other than immediate, straight-line amortization used to mitigate the short-term effects of costs on rates and improve revenue stability
	Ratebase recovery	The inclusion of demand-side expenditures, including general and administrative costs associated with planning and management, in the utility's ratebase
	Special-purpose rates	Rate-design alternatives that enhance the utility's ability to invest in demand-side resources and recover associated costs
Lost-revenue mechanisms	Cost-based pricing	Pricing schemes, such as incremental-cost pricing, that account for short-run and long-run costs so that lost revenues are matched by reduced costs
	Revenue adjustments	Demand-side specific revenue requirement adjustments to compensate for lost sales and revenues
	Decoupling sales	Methods that separate unit sales from revenues, and profits in the regulatory determination of revenue requirements so that reductions in sales do not cause reductions in earnings
	Selling services	A decoupling strategy emphasizing sales of utility services, as compared to sales of conventional utility outputs
	Alternative regulation	Alternatives to traditional ratebase/rate-of-return regulation used to eliminate incentives that favor supply-side over demand-side activities
Performance-motivation mechanisms	Expense or ratebase markup	A percentage markup in the value of certain demand-side expenses or ratebased demand-side investments
	Rate-of-return adjustments	Adjustments to return on equity (or overall rate of return) used to reward or penalize utilities for progress in demand-side programs
	Shared savings	A sharing formula to compensate a utility for some or all of the costs, both direct and indirect, that result from a demand-side program
	Bounty or unit bonuses	A predetermined payment provided to utility shareholders for participating in demand-side programs or exceeding unit conservation goals
	Management rewards	A predetermined payment provided to utility managers for building successful demand-side programs or exceeding unit conservation goals

Source: Beecher, et al., 1994.