Decoupling
vs.
Lost Revenues

Regulatory Considerations

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May 1992

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DECOUPLING V. LOST REVENUES: REGULATORY CONSIDERATIONS

Much of the effort to align utility shareholders' financial interests with the goals of least-cost planning has focused on the removal of the potent disincentives to energy efficiency created by the current ratesetting process.[1] Decoupling and lost revenue recovery are the two general approaches used to eliminate the disincentives. This paper discusses the important characteristics and distinctions between the two options.

At first blush, the lost-base revenue[2] approach appears simple and straightforward. One simply calculates how many dollars a utility has lost due to its DSM programs and increases revenues by that amount. For example, suppose a utility has a program to replace existing electric motors with more efficient ones, and that it estimates that, as a result, its electricity sales are 100 million kwh lower as a result. If each kilowatt hour produced, say two cents in revenue net of fuel and any other variable costs, then the utility would lose $2 million in net revenue to this program which would be recovered under a lost-base revenue adjustment.

A decoupling approach operates differently. Here, one determines during a normal rate case how much revenue a utility requires to cover its expenses and sets an electric rate which is expected to produce that level. Later, perhaps at the end of a year, we return to see whether, in fact, that revenue has been generated or whether, due to fluctuations in sales from the expected level, some greater or lesser amount has been realized. To the extent that the utility has, in fact, received too little (too much) the error is correct through a surcharge (rebate).

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[1] Under current rate-setting practice, energy efficiency investments by a utility cause a loss of profits. This is the case because current rate setting is premised entirely upon the expectation that profits are earned through sales. The regulatory mechanics which give rise to this expectation are that a utility's revenue requirement, as determined at the end of a rate case, is divided by its units of expected sales to set rates. It is through sales that revenues are collected. The more sales, the more revenues. Fewer sales, fewer revenues.

Because energy efficiency reduces sales, it reduces revenues. Even though the calculated revenue requirement may have taken planned energy efficiency activity into account at the time rates were set (by dividing the revenue requirement by fewer units of sale), once rates are set the fundamental sales-yields-revenues relationship continues to drive a utility to maximize sales in order to maximize earnings.

Utilities forego earnings when they invest in energy efficiency yet significant efficiency investments are likely to be a necessary component of a least-cost mix of resources. The task of aligning shareholders' interest with least-cost planning requires changing the underlying regulatory practices which determine how a utility earns a profit.

[2] The phrase lost-<u>base</u> revenues is used to distinguish fuel revenues from base revenues. Fuel revenues comprise nearly all of a utility's variable costs. In most states, fuel revenues are fully recovered on a reconciled basis in fuel adjustment factors. Fuel revenues are not lost as a result of energy efficiency investments.

This illustrates the central distinction between the two approaches. The lost-base revenue approach limits itself to the estimated results of specific DSM measures. The decoupling approach is applied to all changes in utility sales. That is, it decouples the utility's revenue and profit from its sales level. In principle, both approaches address the existing disincentive to utility DSM. In fact, they appear to have quite different results. In the remainder of this paper, we will discuss in some detail these differences and explain why we believe that decoupling is by far the preferable alternative. Unlike the lost-base revenue approach, decoupling removes the utilities' incentive to promote new sales and, unlike lost-base revenue, decoupling does not provide utilities with an incentive to adopt ineffective DSM programs.

Thus far, four states, California, New York, Washington and Maine have adopted decoupling mechanisms. Several other states are now considering decoupling mechanisms. In contrast, the apparent simplicity and perceived effectiveness of the much more narrowly circumscribed LRAs has led many more states to implement lost revenue adjustments. LRAs have been implemented in a number of states including Massachusetts, Rhode Island, Michigan, Ohio, and Indiana.

Overview of the Implications of Decoupling and LRA's

In analyzing the implications of the alternative approaches, we have identified six implications of the alternative approaches. These are summarized in Table 1.

Removal of Sales Incentives

The current system produces very powerful incentives for utilities to increase electricity sales and correspondingly large disincentives to the pursuit of energy efficiency. On a national average basis, each additional kilowatt hour (kwh) a utility sells contributes five cents to its bottom line profit (before income taxes). Thus, if the current ratesetting process is viewed as an incentive plan, the "incentive" or "reward" for each kilowatt hour the utility sells is a nickel. Likewise, a nickel comes off a utility's bottom line each time a kilowatt hour is conserved.

To put the magnitude of this incentive in perspective, a one percent change in a utility's sales has about a 100 basis point impact on its return on equity.

The incentive to sell electricity may manifest itself in various ways. Electricity marketing programs and economic development efforts are the most obvious manifestations. Although promotional activities have been eliminated in some states they continue to be in widespread use in many other states. Even where promotional practices have ostensibly been eliminated, "DSM" programs tend to concentrate on heat-pump installation rather than insulation, expanded area and security lighting rather than lighting retrofits, controlling peak load rather than saving energy and pricing reform such as economic development rates rather than TOU rates.

Table 1. Decoupling v. Lost Revenues

Decoupling	Lost Revenues
Removes sales incentive and all DSM disincentives	Removes some DSM disincentives
Does not require sophisticated measurement and/or estimation	Requires sophisticated measurement and/or estimation
Utility does not profit from DSM which does not actually produce savings	Utility may profit from DSM which does not actually produce savings
Removes utility disincentive to support public policies which increase efficiency, e.g. rate design, appliance efficiency standards, customer initiated conservation	Continues utility disincentive to pursue activities or support public policies which increase efficiency
May reduce controversy in subsequent utility rate cases	No direct effect on subsequent rate cases
Reduces volatility of utility revenue resulting from many causes	Reduces volatility of utility earnings only from specified DSM projects

More subtle than highly visible marketing programs and more problematic for regulators is the fact that regulation does a reasonably good job of reviewing the once-in-a-decade multi-billion dollar decision but a wholly inadequate job of overseeing the thousands of daily decisions of utility managers or the tens of thousands of daily customer contacts. Each of these activities is colored by the existing systems powerful incentives to sell power.

Decoupling entirely separates a utility's profitability from sales volume and, consequently, removes both the disincentives to energy efficiency and the incentive to increase sales. On the other hand, lost revenue adjustments seek to restore only a utility's lost specific revenues associated with identified utility energy efficiency programs. Lost revenue adjustments are not capable of removing the existing incentives to increase sales.

Measurement and Evaluation Issues

Verifying the performance of energy efficiency investments is an important responsibility of regulators, just as is the current responsibility of verifying power plant performance. Measurement and program evaluation techniques for DSM activity have been steadily improving, but it is a developing field and there are many uncertainties. At present only direct program costs are at stake. If lost-base revenues are added to program costs, the total dollars at risk in measurement at least double and could quadruple or more. (Compare two-cent program costs with five cents of lost revenues.)

Lost revenue adjustments rely heavily on accurately measuring the savings actually produced by DSM measures. In order to estimate lost revenues, one must first determine how many kilowatt-hours of energy and kilowatts of peak demand were actually saved. While these saving estimates are typically made as part of the ongoing evaluation of DSM programs, a Lost Revenue Adjustment greatly increases the burden placed on measurement.

Under a LRA regime, DSM savings must be separately determined for practically every different rate a utility charges. At a minimum, kwh and kw savings must be separately established for each customer class which participates. In addition, depending on the utility's rate structure, separate measurement must be made for time of use periods, seasons of the year, and/or voltage levels at which customers take service. In other words, at the very least, measurement must be expanded dramatically from what is required for DSM program purposes alone.

Other questions also arise.

For example: How does one determine the effect of lost revenues resulting from an industrial energy efficiency program which achieves the desired level of energy efficiency improvement but is more than offset by increased levels of industrial production made possible by the increased competitiveness of the industrial consumer?

How much revenue is lost to a DSM program when sales exceed forecasted sales due to weather or other factors?

How does one treat gained revenues from off-system sales of power that may have been made possible by DSM?

While the LRA approach increases the reliance on measurement, it presents the utility with a new set of perverse incentives. After all, utility profits will increase, under an LRA, in direct proportion to the measured or estimated DSM savings, so its goal will be to maximize the <u>measured</u> savings. But revenues are lost only to the extent savings actually occur. For the utility, then, the way to play the LRA game is to maximize <u>measured</u> savings but not to actually save anything at all. In principle, such abuse can be policed. In practice, as we have already noted, DSM program design and administration result from a large number of small decisions which makes regulatory oversight difficult, at best.

Decoupling does not rely upon measurement of DSM program effectiveness. An effective DSM program will not result in a loss of revenues under decoupling and, the more cost-effective the DSM is, the more the program will contribute to the utilities' bottom line under decoupling. But, the burden of identifying and implementing such cost-effective programs (and the attendant duties of developing good measurement techniques) all rest with the utility.

<u>Scope of Activities</u>

A key difference between decoupling and lost revenue adjustments is the scope of activities that are easily covered by the two approaches. Because decoupling separates profits from fluctuating sales levels <u>regardless</u> of the cause of the changed sales volumes, it addresses efficiency impacts resulting from <u>all</u> effects including:

(1) rate design,

(2) all utility-sponsored DSM activities,
(3) energy efficiency achieved through standards and other means, and

(4) energy efficiency measures undertaken by consumers directly, without any utility involvement.

None of these activities are covered by LRAs.

Rate Design

Getting prices "right" is clearly an important element of least-cost planning. Unfortunately, the right prices are often opposed by utilities, due to the impact of those prices on the utilities' cost recovery and earnings stability.

Inverted block rates and time-of-use rates may provide better price signals to consumers than declining block or flat rates. But these price structures are opposed by utilities because of the risk that customer response to the price signals will significantly reduce utility revenues and earnings. With time-of-use rates, for example, customers respond to high "on peak" rates by investing more heavily in energy efficiency or shifting electricity use from on peak to off peak periods. These responses to better price signals result in substantially diminished utility earnings (for example, an "on peak" kwh price of ten cents produces two and a half times the incremental earnings as an "off peak" kwh priced at five cents).

Utilities have had time-of-use rates imposed against their wills and have experienced large revenue and earnings losses. Boston Edison, for example, recently suffered a substantial loss of earnings due to the imposition of steeply differentiated TOU rates. To a utility rate department, the first priority of "getting prices right" is to assure revenue flows.

Decoupling holds utilities harmless from revenue losses resulting from consumer response to better prices and as a result aids in the effort to improve pricing. Lost revenue adjustments, on the other hand, do not address revenue losses associated with implementation of rate design changes.

Scope of DSM Programs

Decoupling also completely addresses efficiency gains from the full array of utility sponsored DSM programs. Energy savings from some utility DSM programs such as educational programs stressing the importance of energy efficiency are, for practical purposes, difficult or impossible to quantify. Because lost revenue adjustments are limited to measured energy efficiency improvements, they do not eliminate the disincentives to these programs.

More importantly, energy efficiency programs can also be undertaken by customers directly or may result from energy efficiency legislation adopted at the state or federal level. Efficiency improvements resulting from these and any activity are automatically covered by decoupling. Because LRAs are limited to quantifiable utility sponsored DSM programs, they do not address these types of activities.

The implications of the limited scope of lost revenue adjustments cannot be overstated. A wide array of efficiency opportunities can be achieved in a very cost-effective manner through efficiency standards and improved customer education and development of energy efficiency infrastructures. Without decoupling, the implementation of energy efficiency in any of these arenas would result in economic penalties to utilities. As a result, utilities will frequently oppose legislation and other activities aimed at substantially improving the energy efficiency of their customers.

Decoupling is important even if one believes that utility investment in DSM should be limited by the no-losers test or that utility sponsored DSM is an interim step along the way to an effective and fully competitive energy efficiency market.

Improved information, capital availability, and better marketing approaches may lead to a proliferation of energy service companies displacing or at least reducing the need for utility involvement. But, the transition to a more competitive market will be impeded by a conflict between utility interests and the interests of the would be competitive providers. Without decoupling we are faced with a situation where success of energy service providers hurts the utility. Will utilities want to help the creation of an energy efficiency industry if that industries success is adverse to the utilities interests? LRAs being limited to utility sponsored DSM, do not address energy efficiency implemented by private vendors.

Controversy in Rate Cases

One of the more controversial aspects of many traditional rate cases in jurisdictions which use future test years or an historical test year with an attrition adjustment is the forecast level of utility sales during the year the new rates will be in effect. Typically, utilities will argue that sales are growing slowly if at all so that rates must be raised to provide additional revenues. Ratepayer representatives often argue that sales will increase sharply and that, as a result, the rate increase can be reduced or eliminated to the extent that new sales provide the additional revenue.

Depending on how it is implemented, decoupling will generally reduce or eliminate controversies over load forecasting. If the total revenue level is set directly, as in the California ERAM approach, load forecasting debates become largely irrelevant because any errors are trued up next year. If the allowed revenue level per customer approach to decoupling is used, as it is in Maine, then the controversy shifts from forecasting energy sales to forecasting the number of customers. Since forecasting energy sales is often a matter of forecasting (a) the use per customer and (b) the number of customers, decoupling in this manner is likely to reduce, but not eliminate, controversy over forecasting.[3]

Lost revenue adjustments, on the other hand, will increase the level of controversy. The LRA approach does nothing to change the role of forecasting. But it introduces a new round of litigation over the kwh savings of the DSM projects. As we have indicated, the issue is complex and the litigation potentially lengthy.

Revenue Volatility

Under traditional regulation, a utility's revenue fluctuates in rough proportion to its sales. Anything which reduces sales, for example weather, economic cycles, appliance efficiency standards, or DSM programs, will simultaneously reduce revenue. An LRA approach will, if it works well, eliminate volatility resulting from those DSM programs it addresses. A decoupling approach, because it is more comprehensive, reduces the volatility in utility revenues more dramatically.

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[3] In states which use an historical test year without an attrition analysis, the weight placed upon the customer count for revenue-per-customer calculations is even less, as it becomes more important to perform the customer count **in the same way from period to period than to know exactly how many customers there are.**

Some have argued that this reduction in the volatility of utility revenues is undesirable. Essentially, the argument is that ratepayers should not be at risk, say, for making up revenues lost due to unusually mild weather. Here, we would offer three comments. First, it is true that the risk is shifted under decoupling. Second, the risk is symmetric; that is, severe weather is also a possibility and would result in ratepayers seeing a benefit when the additional revenues were returned to them. Third, if the risk transfer is significant (and it is unclear that it is), then it will be reflected in the price of the utility's stock and, ultimately, in the rate of return the utility is allowed. Based on these considerations some have argued that the risk transfer represents another advantage, not disadvantage, of decoupling. It is probably better to focus management on risks that are within their control, rather than upon those which are not. A good manager might manage around the edges of abnormal weather or business cycles, but the efficiencies to be gained are few.

Conclusion

For the reasons discussed above, we believe that decoupling is clearly preferred to a lost-base revenue approach in addressing some of the frailties of traditional utility regulation. It is not, however, a panacea. By its nature, decoupling removes an existing disincentive to integrated resource planning. It does not take the next step and provide a positive incentive for good planning. In addition, decoupling only focuses on the short-term (between rate use) disincentive.

On the other hand, decoupling provides a relatively simple mechanism to remove a variety of short-term perverse incentives which live within the existing regulatory structure. The alternative, LRA's, are much more limited in scope, cumbersome in application, and open to abuse.