Northwest Power and Conservation Council

February 9, 2006

MEMORANDUM

TO: Council Members

FROM: Terry Morlan

SUBJECT: Discussion on Regulatory Decoupling

Regulatory decoupling is a shorthand term for changes to utility regulation to improve incentives of utilities to pursue conservation. The decoupling term refers to undoing the link between a utility's profits and their sales of electricity. The intent is to mitigate for the fact that conservation is a resource that costs money but reduces electricity sales and revenues.

The idea has been around for a long time, but has turned out to be difficult to implement. Ralph Cavanagh (Natural Resources Defense Council) and Jim Lazar (Consulting Economist) will discuss the pros and cons of different approaches to decoupling. Both are longstanding experts on regulatory issues and incentives, and both are entertaining speakers.

The relevance of this issue for the Council arises from an action item in the 5th power plan (CNSV-10), which reads, "If revenues lost as a result of conservation remain significant barriers to implementing the cost-effective conservation targeted in the plan, state and local regulators and utilities should consider developing and implementing strategies to mitigate conservation impacts on cost recovery."

The discussion between Ralph Cavanagh and Jim Lazar also will describe some experiences with decoupling efforts in other regions. Your packet includes some background on the issue from the Regulatory Assistance Project. Although the subject matter is somewhat dry, we expect this agenda item to be very entertaining due to the personalities of the panelists.

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Outline
Jim Lazar and Ralph Cavanagh Presentation on Decoupling

[This is rough; these guys are not actually controllable.]

Ralph: What is Decoupling [and some brief reflections on Jim Lazar]

Case Study: Idaho Power

Jim: Where Did "Coupling" Come From in the First Place?

What's a test year?
Why it generally works OK
Why it does not work OK for utility efficiency investment.

Ralph: Experience with Decoupling

California (still operating)
Northwestern States
National Perspective

Jim: Alternatives to Decoupling

High variable cost resources (gas / market) link SRMC and Rates
Lost Margin Mechanisms
Fixed / Variable Rate Design
Conservco / Energy Trust / Efficiency Vermont

Ralph: Why the Alternatives Don't Work As Well as Decoupling

And why decoupling is a necessary but not sufficient way of getting utilities' incentives right

Jim: Key Elements for Successful and Fair Decoupling

Commitment to Invest in Efficiency
Progressive Rate Design
Capital structure adjustment
Rate Collar
Scheduled Periodic Rate Cases

Regulatory Assistance Project
Issuesletter
September 2005

Regulatory Reform: Removing the Disincentives To Utility Investment in Energy Efficiency

Utilities lose revenues and profits when they or their customers invest in cost-effective energy efficiency. In 1989, The National Association of Regulatory Utility Commissioners (NARUC) adopted a resolution that expressly recognized this serious impediment to greater use of the energy efficiency resource, and recommended a simple and unequivocal response: Reform regulation to align the utility's financial interest with the interests of its customers in having energy efficiency integrated into the utility's resource portfolio.

Interest in addressing the regulatory disincentives to energy efficiency investments flagged during the past decade due to low natural gas prices, which made efficiency a lower priority, and the general turmoil of restructuring. During that time, energy efficiency moved from being regarded an important energy resource to being perceived as a social program supported by System Benefit Funds. Today, with the steep increase in natural gas prices and a growing concern regarding carbon emissions, tapping the energy efficiency resource has once again moved to the forefront of the working agenda for many utility regulators. Understanding the regulatory disincentives to utility investment in energy efficiency is essential for regulators who want to see greater investment in this under-used, environmentally clean, bill-reducing resource.

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Every regulatory system creates a set of incentives and disincentives. Some are deliberate, and others are unintended but just as effective. Traditional ratemaking results in some strong disincentives to acquiring energy efficiency. These include:

1. Utilities lose revenues and profits from sales not made as a result of successful energy efficiency programs.
2. By devoting resources to efficiency programs rather than to other profit-making activities, utilities forego earning opportunities.
3. Utilities are often restricted in how they can recover efficiency program expenses.

It is incumbent upon regulators to recognize what disincentives in the traditional ratemaking process make energy efficiency investments financially objectionable to utilities and decide whether incentives should be instituted. Regulators cannot police every decision utility management makes. Aligning a utility's financial

interest with articulated public policy objectives is a powerful means of encouraging utilities to make decisions in a manner that is consistent with policy objectives.

How Lost Revenues Occur

THE TRADITIONAL REGULATORY SYSTEM produces very powerful incentives for utilities to increase electricity and electricity sales and correspondingly large disincentives to the pursue energy efficiency. For example, on a national average, each additional kWh a utility sells contributes 5¢ to its bottom line profit (before income taxes). Thus, if the current rate setting 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 reason for this is that traditional rate setting is based on the following formula:

$$\text{Revenue Requirements} = \text{Expenses} + (\text{Rate Base} * \text{Rate of Revenue})$$

The utility's revenue requirement is the total dollar amount the utility needs to operate, including a fair return on shareholders' investment. In effect, this is the amount of money regulators determine the utility needs. The next step in a rate case is to set rates. This is done by dividing revenue requirements by sales.

$$\text{Rates} = \frac{\text{Revenue Requirement}}{\text{Sales}}$$

This derives a price per kWh (or Ccf) which customers are charged. Regardless of what level of revenues the commission decides was needed, once rates are set, the utility's actual revenues are linked to and driven by sales until the next case. The more sales a utility makes, the more revenue it receives. Every lost sale means less revenue.

Profits and revenue, however, are not the same. Profits are the difference between revenues and costs. Thus to know how increased sales affect profits, one needs to know how increased sales affect costs. The answer is simple. The only costs that significantly increase with increased sales, at least in the period between rate cases, are fuel and purchased power costs. In most states, fuel and purchased power costs are subject to fully reconciled, automatic adjustment clauses. These adjustment clauses have the effect of making fuel costs the customer's, not the utility's, responsibility. This means that higher fuel costs have no impact on utility earnings.

The problem of lost profits is much worse for stand-alone distribution companies (a typical structure for most gas companies and for several electric companies in restructured states) because the ratio of fixed costs to avoidable costs is much higher for distribution companies.

The relationship between profits, rates and costs can be distilled into two formulas, one for states with fuel clauses and one for states without them:

States with fuel clause:

$$\text{Increased Profit} = \text{Retail Rate} - \text{Average Fuel Cost}$$

States without fuel clause:

$$\text{Increased Profit} = \text{Retail Rate} - \text{Marginal Fuel Cost}$$

If utilities profit by increasing sales, successful efficiency programs that result in a customer using fewer kWhs cause the utility to lose profit that it would have otherwise received. That is hardly an encouragement to implement efficiency. Even when reductions due to efficiency investments are factored into the expected sales, it is still not in the utility's real financial interest to pursue vigorously programs which decrease customer usage. These lost revenues inevitably undermine a commission's best efforts to compel a utility to use all cost-effective energy efficiency as a viable alternative to more costly new generation.

Regulatory Solutions: Adjustable Revenue Caps Or, Lost Revenue Adjustments?

ADJUSTABLE REVENUE CAPS (also known as decoupling or, conservation tariffs) and Lost Base Revenue Adjustments (LRAs) are the two approaches generally used to eliminate the disincentives and address the issue of demand-side profitability. Using a lost base revenue adjustment,[1] one calculates how many dollars a utility has lost due to its energy efficiency programs, then increases revenues by that amount. For example, suppose a utility has a program to replace existing electric motors with more efficient ones. The utility estimates that its electricity sales will fall by 100 million kWh by pursuing this replacement effort. If each kWh produced 2¢ in revenue net of fuel and any other variable costs, the utility would lose $2 million in net revenue to this program. Under a LRA approach, this amount would be subsequently recovered.

An Adjustable Revenue Cap (ARC) approach operates differently by severing a utility's allowed revenue from its sales. To do this, the commission determines during a normal rate case how much revenue a utility needs to cover its expenses and sets an electric rate which is expected to produce that level. Later, perhaps at the end of a year, the commission and the utility 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. When the utility has received too little, the error is corrected through a surcharge. If the utility has received too much, the error is corrected through a rebate.

In principle, both approaches address the existing disincentive to utility energy efficiency, but in fact the results from the two approaches are quite different. LRA limits itself to changes in revenues resulting from specific efficiency measures. The ARC approach is applied to *all* changes in utility sales and therefore removes the utilities' incentive to promote new sales. LRAs are not capable of removing existing incentives to increase sales.

Because ARCs separate profits from fluctuating sales levels regardless of the cause of the changed sales volumes, it addresses efficiency impacts resulting from all effects including:

- rate design
- all utility-sponsored energy efficiency activities
- energy efficiency achieved through standards and other means

1 The phrase lost-*base* 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 recov¬ered on a reconciled basis in fuel adjustment factors. Fuel revenues are not lost as a result of energy efficiency investments..

- energy efficiency measures undertaken by consumers directly, without any utility involvement.

At the moment, all of California gas and electric utilities and one of Oregon's gas utilities have ARC mechanisms in place. Other states such as Montana and Washington are considering them. Prior to the intense restructuring of the electric industry in the 1990's, seven states, California, New York, Washington, Kentucky, Oregon, Montana and Maine had adopted decoupling mechanisms. Historically, the apparent simplicity and perceived effectiveness of the more narrowly circumscribed LRAs led many more states (including Massachusetts, Rhode Island, Michigan, Ohio and Indiana) to implement LRAs.

	Adjustable Rate Caps	Lost Revenues
Sales	Removes sales incentive and all energy efficiency disincentives.	Removes some energy efficiency disincentives, does not remove sales incentives.
M & E	Does not require sophisticated measurement and/or estimation	Requires sophisticated measurement and/or estimation.
	Utility does not profit from energy efficiency which does not actually produce savings.	Utility may profit from energy efficiency which does not actually produce savings.
Scope	Rate design All energy efficiency programs Customer energy efficiency Efficiency standards	Addresses revenues lost due to utility energy efficiency programs only.
Other	Eliminates load forecast gaming.	No direct effect on subsequent rate cases.
	Low litigation potential, low administrative cost.	Cost recovery uncertainty, litigation prone, high administrative cost.
	Reduces volatility of utility revenue resulting from many causes.	No effect on the volatility of utility

Rate Design

WHEN MARGINAL COSTS are rising, inverted block rates and time-of-use (TOU) rates clearly provide better price signals to consumers than declining block or flat rates. But utilities oppose these price structures because of the risk that customer response to the price signals will significantly reduce utility revenues and earnings. With TOU 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 10¢ produces two and a half times the incremental earnings as an off-peak kWh priced at 5¢). Utilities have had TOU rates imposed against their resistance and have experienced significant revenue and earnings losses. To a utility rate department, the first priority of "getting prices right" is to assure stable revenue flows. Rates which signal customers to reduce use during high cost periods jeopardize stable revenues. ARCs hold utilities harmless from revenue losses resulting from consumer response to better prices and as a result aids in the effort to improve pricing. LRAs, on the other hand, do not address revenue losses associated with implementation of rate design changes.

Concern with Measurement And Evaluation of Efficiency

VERIFYING THE PERFORMANCE of energy efficiency investments is as important a responsibility of regulators as verifying power plant performance. Measurement and program evaluation techniques for energy efficiency activity have been steadily improving, but the field is

developing, and uncertainties persist. LRAs rely heavily on accurately measuring the savings actually produced by energy efficiency 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 energy efficiency programs, a LRA greatly increases the burden placed on measurement because so many additional dollars depend on the measurement outcomes.

Adding LRAs to program cost can at very least double and possibly quadruple the total dollars at risk in measurement (Compare a 2¢ program costs with 5¢ of lost revenues.). Under a LRA regime, energy efficiency 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 participating customer class. In addition, depending on the utility's rate structure, separate measurements must be made for the TOU periods, seasons of the year and/or voltage levels at which customers take service. In other words, measurement must be expanded dramatically from what is required for energy efficiency program purposes alone.

Other measurement questions arise:

- How does one determine the effect of lost revenues resulting from an industrial energy efficiency program which, on the one hand, achieves the desired level of energy efficiency improvement? On the other hand, these savings are more than offset by increased levels of industrial production now made possible by the increased competitiveness of the industrial consumer.
- How much revenue is lost to a energy efficiency program when sales exceed forecasted sales due to weather or other factors?
- Do LRAs create an incentive to subsidize customer-initiated energy efficiency so that the utility will be able to recover lost revenues?

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 a LRA in direct proportion to the measured or estimated energy efficiency savings, so the goal will be to maximize the *measured* 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 *measured* savings but not to actually save anything at all. In principle, such abuse can be policed. In practice, energy efficiency program design and administration result from a large number of small decisions which makes regulatory oversight difficult.

While regulation does a reasonably good job of reviewing the once-in-a-decade, multi-billion dollar decision, it does an inadequate job of overseeing the thousands of daily decisions of utility managers or the tens of thousands of daily customer contacts. Adjustable Revenue Caps do not rely upon measurement of energy efficiency program effectiveness. An effective energy efficiency program will not result in a loss of revenues under an ARC.

The Source and Scope of Energy Efficiency Savings

ARCs ALSO ADDRESSES efficiency gains from the full array of utility-sponsored energy efficiency programs. Energy savings from some utility energy efficiency programs, such as educational programs stressing the importance

of energy efficiency are, for practical purposes, difficult or impossible to quantify. Because LRAs are limited to measured energy efficiency improvements, they offer no incentives to provide these programs.

Energy efficiency can occur from legislation such as appliance standards or improved building codes adopted at the state or federal level, or customers may undertake energy efficiency directly. Reduced revenues caused by efficiency improvements originating from activities such as these are automatically covered by decoupling. Because LRAs are limited to quantifiable, utility-sponsored energy efficiency programs, they do not address these types of activities. The implications of this limited scope of LRAs are wide ranging. A wide array of efficiency opportunities can be achieved in a very cost-effective manner through efficiency standards,

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improved customer education and development of energy efficiency infrastructures. In the absence of decoupling, the implementation of energy efficiency in any of these arenas penalizes the utilities. As a result, utilities will frequently oppose legislation and other activities aimed at substantially improving the energy efficiency of their customers.

Without decoupling, the success of energy service providers hurts the utility. Will utilities want to help create an energy efficiency industry if that industries' success is adverse to the utilities' interests? LRAs, because they are limited to utility-sponsored energy efficiency, do not address energy efficiency implemented by private vendors.

Adjustable Revenue Caps As The Favored Alternative

FOR THE REASONS discussed above, Adjustable Revenue Caps do a better job than the Lost Revenue Adjustments approach in addressing important frailty of traditional utility regulation. ARCs are not, however, a panacea. An ARC will effectively remove the harmful disincentive to energy efficiency investment but, it does not take the next step and provide a *positive incentive* for those utilities that achieve effective risk reduction and lower bill for their customers through effective use of the energy efficiency resource. Our next *Issueletter* will discuss the needed second step: *Providing Incentives For Effective Risk Reduction Through Investment in Energy Efficiency.*

For More Infornation:

VISIT OUR WEBSITE www.raponline.org and click on *Regulatory Incentives* or *Decoupling.*

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Pass The Word

Pass this Issuesletter around to others and let us know who we should add to our mailing list. As always, we welcome ideas for future issues.

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REMOVING DISINCENTIVES TO UTILITY INVESTMENTS IN ENERGY EFFICIENCY: AN IDAHO CASE STUDY

NORTHWEST POWER AND CONSERVATION COUNCIL

February 22, 2006

l by Ralph Cavanagh, NRDC [rcavanagh@nrdc.org]

NRDC

THE EARTH'S BEST DEFENSE

ILLUSTRATING THE PROBLEM

Like most utilities, Idaho Power (IP) recovers most of its fixed costs through the rates it charges per kilowatt-hour. In other words, a part of the cost of every kWh represents the system's fixed charges for existing plant and equipment; the rest collects the variable cost of producing that kilowatt-hour. After approving a fixed-cost revenue requirement, the Idaho PUC sets rates based on assumptions about annual kilowatt-hour sales. If sales lag below those assumptions, IP will not recover its approved fixed-cost revenue requirement. By contrast, if IP were successful in promoting higher consumption than regulators expected, its shareholders would earn a windfall in the form of cost recovery that exceeded the approved revenue requirement. And whether consumption ends up above or below regulators' expectations, every reduction in sales from efficiency improvements yields a corresponding reduction in fixed-cost recovery, to undercutting the utility's financial health.

MORE SPECIFICALLY

[Adapted from 2005 Testimony before Idaho PUC]

AUTHORIZED IP FIXED-COST REVENUE REQUIREMENT (FCRR):	$300 million
FCRR ALLOCATED TO VARIABLE ENERGY CHARGES:	$235 million
FCRR ALLOCATED TO VARIABLE DEMAND CHARGES	$55 million
FCRR ALLOCATED TO FIXED CHARGES:	$10 million
INITIAL COST-RECOVERY IMPACT OF 1% REDUCTION IN SALES:	-$2.9 million
FIVE YEAR IMPACT OF ENERGY-EFFICIENCY PROGRAMS SAVING 1% OF SYSTEM USE/YR:	-$43.5 million

PROPOSED SOLUTION

Introduce regular true-ups in IP's rates to break the link between retail sales and recovery of authorized fixed costs. If, after initial year, changes in retail electricity use lead to under- or over-recovery of fixed cost revenue requirement, a rate true-up would occur in the following year. Until reestablished in the next rate case, the last approved fixed cost revenue requirement would be automatically adjusted annually to reflect percentage increases or decreases in the number of customers served by the company. True ups would occur annually, and rate reductions or increases should not exceed 1.5% (based on analysis of recent consumption trends on IP system).

Implementing Decoupling:
Assuring Benefits for Shareholders, Billpayers and the Environment

NORTHWEST POWER AND CONSERVATION COUNCIL

February 22, 2006

Jim Lazar, Consulting Economist

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Pacific Power Washington
Effect of NRDC Decoupling Mechanism

Average Retail Rate			$ 0.054
Average Wholesale Rate Over 5-year Period			$ 0.069
Average Net Benefit of Shifting Retail to Wholesale			$ 0.015
1% of Sales (kwh)			40,137,581
5-Year Benefit of 1% Per Year Compounding Conservation			$ 10,301,050
Cavanagh Method -- Ignoring Wholesale Revenues			$ (21,000,000)
Difference:			$ (31,301,050)

Effect of Decoupling and Associated Equity Ratio Adjustment

$1 Billion Utility Rate Base

Equity Ratio		45%		40%
Return on Equity		10.3%		10.3%
Cost of Equity		$ 46,350,000		$ 41,200,000
Taxes on Equity @ 35%		$ 24,957,692		$ 22,184,615
Debt Ratio		55%		60%
Interest Rate on Debt		7%		7%
Cost of Debt		$ 38,500,000		$ 42,000,000
Tax Benefit of Debt @ 35%		$ (13,475,000)		$ (14,700,000)
Total Revenue Requirement For Return		$ 96,332,692		$ 90,684,615
Savings from Decoupling and Equity Ratio Adjustment:				$ 5,648,077