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Briefing Paper

Revenue Decoupling for Natural Gas Utilities

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EXECUTIVE SUMMARY

High natural gas prices have provoked recent proposals to modify long-held ratemaking practices for gas utilities. Energy conservation has emerged as an option to address the serious problem of consumers suffering from accelerating gas bills. With a heightened emphasis on energy conservation, gas utilities have expressed concern about the implications of lower gas usage for their financial stability. In response to this situation, gas utilities as well as conservationists have advocated a ratemaking mechanism generically labeled revenue decoupling (RD). From the perspective of gas utilities, RD can prevent financial erosion from future reductions in consumption by gas consumers. Conservationists view RD as indispensable in eliminating the disincentive for gas utilities to promote energy conservation under standard ratemaking.

This briefing paper reviews the activities to date on the application of RD for gas utilities. Five gas utilities presently have commission-approved RD mechanisms. Several others have RD proposals pending before their state commissions. Consumer groups and others have posed several arguments in disfavor of RD. Some state commissions have endorsed RD while others have opposed it. This paper lists the arguments on both sides together with an assessment of their merits.

This briefing paper takes a balanced perspective of RD by directing attention to both the upside and downside of this ratemaking mechanism. It specifically analyzes the efficacy of RD in fostering prevailing regulatory and ratemaking objectives. The paper's primary intent is to make state commissions as well as other policymakers better informed on the likely outcomes of RD. While this paper concentrates on the natural gas industry, much of its content applies equally to both the electric and water industries.

Contents

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BACKGROUND

High natural gas prices have had a profound effect on both local gas utilities and consumers.

High natural gas prices since 2000 have had a profound effect on both local gas utilities and consumers. Utilities have witnessed consumers responding to high prices by curtailing their gas use, with the consequence of lost earnings. State commissions have increasingly pressured, and in some instances required, gas utilities to become more active in promoting energy efficiency, largely to reduce consumers' gas bills in both the short and long run. Consumers have experienced hardships from less discretionary income for non-gas products and services, including other necessities such as food and housing for low-income households. To reduce the cost pressures on utilities as well as the burden on consumers, gas utilities anticipate that regulators and other policymakers will increasingly exert pressure on them to broaden their functions and the services they offer, specifically by being more engaged in promoting energy conservation.

Under standard ratemaking, utilities have strong motivation to promote gas sales.

Under standard ratemaking as practiced in the vast majority of states, gas utilities have strong motivation to promote gas sales between rate cases. Owing to regulatory lag, whenever sales grow, earnings directly increase because of the prevailing rate structure that incorporates most of a utility's fixed costs into its volumetric charge.[1] Conversely, when a utility sells less gas it recovers a smaller portion of its fixed costs. State commissions have endorsed this rate design, which has a long history, largely on grounds of equity. Over the past few years, at the requests of gas utilities in rate filings, volumetric charges have included less fixed costs to reduce the utility's risk from sales fluctuations.[2] Still, with few exceptions, utilities' shareholders shoulder financial harm in varying degrees whenever sales decline between rate cases.

Both utilities and conservationists are promoting revenue decoupling, which severs the link between earnings and sales.

In response to the sales repression triggered by market forces and the regulatory goal in several states for utilities to promote and fund energy efficiency initiatives, several gas utilities have recently proposed to their state commissions a "tracker" mechanism that severs the link between their earnings and sales. Both gas utilities and conservationists have aggressively fostered this ratemaking mechanism, generically labeled in this paper as revenue decoupling (RD).[3] While retaining adequate earnings is the driving motive of gas utilities, conservationists view revenue decoupling as indispensable for removing the resistance of utilities to promoting energy efficiency.[4]

These seemingly strange bedfellows are mounting a strong charge to reshape fundamentally ratemaking practices for relieving the utility's risk from lower sales between rate filing. As evidence, in 2004 the American Gas Association (AGA)[5] and the Natural Resources Defense Council issued a joint statement in support of RD and submitted it to the National Association of Regulatory Utility Commissioners (NARUC). The Joint Statement expressed agreement of the two groups on "the importance of state Public Utility Commissions' consideration of innovative programs that encourage increased total energy efficiency and conservation in ways that will align the interests of state regulators, natural gas utility company customers, utility shareholders and other stakeholders."[6] In 2005, NARUC passed a resolution advising state commissions to consider the implementation of revenue decoupling. The resolution stated that revenue-decoupling mechanisms "may assist, especially in the short term, in promoting energy efficiency and energy conservation and slowing the rate of demand growth of natural gas."[7] As discussed below, gas utilities and conservationists, while generally supportive of RD, relate different stories about the merits of RD.

Not all gas utilities are supportive of revenue decoupling. In the investigation of revenue decoupling by the Connecticut Department of Public Utility Control, some gas utilities opposed a full-sales adjustment mechanism by arguing that it would remove their incentive to add new customers, increase their rates, and lead to a lower authorized rate of return. One gas utility consultant has argued that RD could create additional costs to a utility: (1) regulators could be under pressure to lower the utility's authorized rate of return, (2) in an environment of high gas prices, it may be especially difficult for a utility to secure regulatory approval of a decoupling mechanism without making a commitment to energy efficiency initiatives, and (3) the utility may have to agree on other concessions in rate case settlements in return for approval of RD. [8]

On the other side of the debate are those who have raised concerns about the desirability of RD as a ratemaking tool. These skeptics emphasize the downside effects of "guaranteeing earnings" and the possibility of higher rates in the short term.

Skeptics have raised concerns about the desirability of RD as a ratemaking tool; and not all gas utilities are supportive.

To date, state commissions have reacted differently to RD proposals, reflecting their ambivalence about whether this ratemaking mechanism advances long-held ratemaking and regulatory objectives. This is not so surprising, since RD has more obvious benefits to a gas utility than to its consumers and utilities vary as to their commitments to promoting energy efficiency.

Interest in RD also exists nationally and regionally. Last year, the Western Governors' Association supported RD for electric utilities to boost energy efficiency initiatives in addition to specific performance incentives that reward utilities for cost-effective initiatives.[9] The Energy Policy Act of 2005 (EPAct of 2005) (Section 139, Subtitle C) requires the U.S. Department of Energy within one year of enactment of the Act, in consultation with NARUC and the National Association of State Energy Officials, to conduct a study of state and regional policies that promote cost-effective conservation programs. The policies, among other things, should take into consideration methods of "removing disincentives for [gas and electric] utilities to implement energy efficient programs" and "ensuring appropriate returns on energy efficiency programs." Also at the national level, the U.S. Environmental Protection Agency has undertaken a Clean Energy Policy Initiative that will review RD in terms of removing disincentives for natural

Interest in RD is at the national, regional, and state level.

The Maryland, California, Oregon, and North Carolina commissions have approved RD mechanisms.

gas and electric utilities to promote energy efficiency.[10]

CAPSULE OF STATE ACTIVITIES

At the time of this briefing paper, state commissions had approved RD for five gas utilities.[11] These gas utilities are Baltimore Gas and Electric,[12] Washington Gas Light in Maryland, Southwest Gas in California,[13] Northwest Natural in Oregon, and Piedmont Natural Gas in North Carolina. Last August, the Oregon Public Utility Commission extended Northwest Natural's RD mechanism to four years and modified the mechanism by allowing for 100 percent decoupling (previously it was 90 percent), excluding weather effects.[14] These approvals were motivated by at least one of two factors. The first was evidence showing an historical decline in gas usage per household, which was anticipated to continue in the future; the second pertains to the intent of a state commission to have the utility aggressively and successfully promote energy efficiency. With the expectation of falling sales per customer, it was the apparent belief of those commissions approving a RD mechanism that the utility would not have a reasonable opportunity to earn its authorized rates of return unless a RD-type mechanism was in place. For other RD approvals, notably for Northwest Natural, the commission acknowledged that RD should go hand-in-hand with its intent to have the utility promote energy efficiency.

Commissions approved RD mechanisms because:
- *Gas usage per household has been declining*
- *The commissions want regulated utilities to promote energy efficiency*
- *Without a RD mechanism, the utility might not be able to earn its authorized rate of return.*

In the Piedmont Gas order, the North Carolina Utilities Commission said that:

> The customer utilization tracker [CUT] represents a departure from the ratemaking approach traditionally approved by the Commission, in which no one element is singled out for ratemaking without consideration of other, countervailing elements…In this case approving the CUT as an experimental rate for a limited period of time will allow the Commission to monitor experience under the formula—including its impact on the Company's earnings, on conservation efforts, and on traditional ratemaking theory—before the CUT is approved as a permanent part of Piedmont's rate structure.[15]

The Commission opined that the CUT should benefit customers by giving the utility "a conservation incentive to assist residential and commercial customers." It also said that the RD mechanism would reduce the frequency of future rate cases as well as shareholder risk.[16]

As of early 2006, several gas utilities have filed RD proposals with their state commissions in Indiana, New Jersey, Ohio, Utah, and Washington. The gas utilities filing a RD mechanism include Cascade Natural Gas (WA), Puget Sound Energy (WA), Puget Energy (WA), Questar Gas (UT), Citizens Gas and Coke Utility (IN), Vectren Energy Delivery (IN, OH), New Jersey Natural Gas, and South

Jersey Gas. In the Vectren Energy Delivery of Ohio application, the utility argued that its revenue-decoupling proposal would "sever or 'decouple' the traditional relationship between sales or throughput and revenue as the essential foundation for a realignment of interests to better advance Ohio's energy policy."[17] The RD proposal by Questar Gas has received the support of the Utah Division of Public Utilities. A witness representing this group testified that the proposed "conservation enabling tariff" would "protect Questar's revenues from shortfalls due to price shocks and economic downturns."[18] In the case of South Jersey Gas, the utility said it would commit to a comprehensive set of programs designed to both educate and provide incentive to customers for conserving gas, once the Board approves its "conservation" tariff. As expressed by the utility's President and CEO, "Under this pilot program, the existing link between customer usage and cost of service recoveries will be severed. As a result, the company can aggressively and creatively encourage changes in customer behavior that lead to increased conservation without negatively impacting out financial stability."[19]

In October 2005, the Washington Utilities and Transportation Commission closed its rulemaking docket without action (Docket No. UG-050369) by stating that it "believes that the wide variety of alternative approaches to decoupling make it more efficient to address these issues in the context of specific utility proposals included in general rate case filings rather than through a generic rulemaking." The commission encouraged utilities to file a RD proposal if they deem that such a proposal would "overcome disincentives to their offering… conservation programs."

Gas utilities in Indiana, New Jersey, Ohio, Utah, and Washington have filed RD proposals.

In January 2006, in a report to the state legislature[20] the Connecticut Department of Public Utility Control rejected the implementation of RD in the form of sales and per customer adjustment clauses for either gas or electric utilities.[21] The Department particularly found problematic the shifting of normal business risk from a utility to consumers.[22] It also said that market forces (namely, high gas prices) have stimulated much energy conservation.[23] Besides, as expressed by the Department, gas utilities currently have a conservation adjustment mechanism, which is used to recover from consumers both the costs of utility-sponsored programs and lost revenue from sales foregone attributable to those conservation programs. Consumer groups in the state also oppose RD in the form of sales and per-customer adjustment clauses, with the general argument that consumers would unlikely benefit while a utility would have "guaranteed" earnings.[24]

In Arizona, Minnesota, and Nevada RD proposals have been rejected or withdrawn.

The rejection or withdrawal of RD proposals has occurred in a few states, including Arizona, Minnesota, and Nevada.[25] For example, in early 2006 the Arizona Corporation Commission rejected a proposal by Southwest Gas (called a "Conservation Margin Tracker" or "CMT").[26] The Commission reasoned, "there is conflicting evidence in the record as

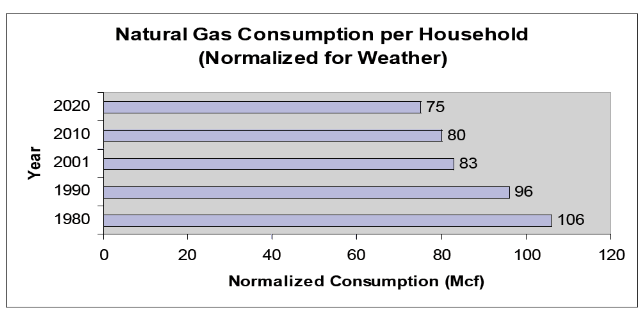
Increasingly energy efficient gas appliances and home construction are responsible for much of the substantial decline in natural gas usage.

to whether the recent level of declining per customer usage will continue into the foreseeable future, and whether conservation efforts are the direct cause of Southwest Gas' inability to earn its authorized return from such customers." The Commission added, "The Company is requesting that customers provide a guaranteed method of recovering authorized revenues, thereby virtually eliminating the Company's attendant risk. Neither the law nor public policy requires such a result nor do we decline to adopt the Company's CMT in this case." The commission opined that the issue of declining usage per customer "should be fully explored as part of a broader investigation of usage volatility and margin recovery."[27]

IMPETUS FOR REVENUE DECOUPLING

As mentioned above, two factors explain the heightened interest in RD for gas utilities. Both relate to the ongoing energy conservation resulting from the combination of high natural gas prices and utility-funded energy efficiency initiatives. According to an AGA study, natural gas usage per household (normalized for weather) has declined by over 20 percent since 1980.[28] Major reasons for this include progressive increases in energy-efficient gas appliances and home construction.[29] The study predicts this decline will continue over the next several years, although at a lower rate than since 1980.[30] (See Figure 1.) The AGA study, published in 2004, may have underestimated future declines if for no other reason than that natural gas prices have soared since then. If one assumes that consumers are price-responsive, even in the short run, which coincides with past consumer behavior, further drops in gas consumption per customer below those projected in the AGA study may come to fruition.[31]

The phenomenon of declining usage per household over the past several years, while not universal, probably has occurred for most U.S. gas utilities.[32] Some gas utilities have experienced particularly sharp declines. For example, Questar Gas in Utah estimated that, adjusting for



Source: AGA, *Forecasted Patterns in Residential Gas Consumption, 2001-2020*, EA 2004-04, Sept. 21, 2004.

Fig. 1. Declining usage per household.

weather, its typical residential customer currently uses about 35 percent less natural gas than in 1980.[33]

Declining usage per customer over time per se does not necessarily rationalize a RD-type mechanism.[34] Its defense as a ratemaking mechanism becomes more tenable, however, when base (delivery) rates do not reflect this "consumption" dynamics.[35] Common in recent rate case filings is the argument by gas utilities that in calculating sales for the rate period, historical sales should be adjusted to account for declining usage (or weather normalized over a relatively short time period, for example ten years or less).[36] Otherwise, utilities may find it difficult to earn their pre-determined authorized rate of return.[37] Recognizing that a commission may not accept this adjustment in setting new rates for various reasons, which more times than not has been the case, a utility would then find RD as the only available option (except for a radical change in rate design, which would likely confront strong opposition) to protect itself against revenue shortfalls.

Another reason for utilities' interest in RD is the growing intent of state commissions and other groups to have gas utilities promote energy efficiency. Largely because of high natural gas prices, state commissions have shown greater propensity for requiring gas utilities to become more active in promoting energy efficiency. Many industry observers view energy efficiency as the most effective option to soften gas prices over the next few years.[38] Gas utilities themselves seem to be supportive of energy efficiency as long as it does not adversely affect their shareholders. This explains why some utilities have proposed RD mechanisms as a ratemaking mechanism that would protect their shareholders if sales reductions ensue from successful energy efficiency initiatives.

Table 1 provides the fundamental arguments in support of revenue decoupling. These are the major contentions—some advanced by gas utilities while others by conser-vationists—that have been made in state-commission proceedings. At first sight, they come across as a persuasive and coherent case for RD. As discussed in more detail below, RD can assist in promoting energy efficiency: while RD does not provide the utility with an explicit incentive to promote energy efficiency, it eliminates the disincentive. In other words, if a state commission wants a utility to effectively and aggressively "sell" energy efficiency, then RD or least some other mechanism (for example, straight fixed-variable rate design for gas delivery[39]) that would not discourage a utility from selling less gas should be seriously contemplated. Besides, it would seem both unfair and counterproductive to order a utility to promote energy efficiency when detrimental to its shareholders.

Another argument in favor of RD is that small changes in gas sales can have a significant effect on earnings. Gas sales are also largely outside the control of a utility in addition to being highly volatile from year to year, with weather as the major factor. Since almost all of a utility's short-run, non-

With recent soaring natural gas prices, there may be further drops in gas consumption.

Declining use per customer does not necessarily call for RD mechanisms. It becomes more defnsible when base delivery rates do not account for dynamic changes in consumption.

RD eliminates a disincentive to promote energy efficiency.

TABLE 1
UNDERLYING RATIONALE FOR REVENUE DECOUPLING

Energy efficiency can benefit consumers and society in both the short and long run	Given existing rate design, variations in sales directly affect a utility's net revenues or earnings
Current rate design creates disincentives for a utility to promote energy conservation	A small percentage change in sales can have a significant effect on a utility's earnings
Gas sales are highly volatile from year-to-year for different reasons, most of which are beyond a utility's control	Almost all of a gas utility's short-run non-gas costs are fixed, meaning they stay virtually constant when sales change
Rate structures encourage utilities to increase sales between rate cases (which may be contrary to state policies)	Most of a utility's fixed costs are recovered through the volumetric charge
Determining future sales is a contentious issue in rate cases	Full recovery of fixed costs depends on actual gas sales equaling sales levels calculated in the last rate case
Consumption per residential customer (adjusting for weather) has continuously declined over the past 25+ years in most regions of the country, and this trend is expected to continue in the future	Fixed costs recovered in the customer charge would reduce consumers' incentive to conserve

Source: Author's construct.

One argument in favor of RD is that small changes in gas sales can have a significant effect on earnings.

gas costs are invariant to changes in sales,[40] a mechanism such as RD that adjusts for sales fluctuations, rather than cost changes, would seem valid.

As an illustration of how a small change in sales between rate cases can have a large effect on a utility's earnings, let us assume that:

(1) $E^* = R^* - FC - VC$
(2) $\Delta R\ (\Delta Q \times P) - \Delta VC = \Delta E$
(3) $(R/E) \times ([\Delta R - \Delta VC]/R) = \Delta E/E = \Delta ROE/ROE^*$

Where E = earnings to common equity shareholders, R = revenues, FC = fixed costs (exclusive of equity returns), VC = variable costs, ΔQ = the change in the quantity of sales relative to the test-year level, P = the delivered price of gas, ROE = rate of return on equity, and * = targeted or authorized levels for the specified parameters. Equation (1) assumes that common equity shareholders hold residual claims to a utility's earnings. Equation (2) says that changes in the earnings to common equity shareholders equal the difference between changes in revenue and variable costs (i.e., the change in net revenues). Equation (3) relates the proportional changes in earnings and the rate of return on equity to the change in net revenues and the ratio of revenues to earnings to common equity shareholders.

For illustration, let us assume that: (1) the utility's authorized revenues (R*) are $400 million, (2) fixed costs (FC) equal $360 million (thus, the targeted earnings to common equity holders is $40 million), (3) variable costs for gas distribution equal zero,[41] and (4) the authorized rate of return on equity (R*) equals 12 percent.[42] Assuming that gas sales are 1 percent less than expected (i.e., R = $396) because of a reduction in gas use per customer, the decrease in earnings to common equity holders would sum to $4 million, which is a decline of 10 percent [($40 million - $36 million)/$40 million)]. This also translates into a decrease of the pre-tax rate of return on equity (ROE) of 10 percent or from 12 percent to 10.8 percent (i.e., 120 basis points).[43] In sum, the reduction of sales and revenues by 1 percent is concomitant with a 10 percent drop in earnings to common equity holders.

With the large increases in natural gas prices over the past few years, gas sales will likely experience some (unknown at this time) downward movement, assuming other things held constant. As an example, with a 30 percent increase in the delivered price of gas in real dollars, and assuming a short-run price elasticity of demand equal to -0.10 (which corresponds closely to econometric studies), gas sales would fall by 3 percent because of the price increase. Applying the relationships in the above illustration, this drop in sales would cause pre-tax earnings to common equity shareholders to fall as much as 30 percent.

BASIC STRUCTURE OF A REVENUE DECOUPLING MECHANISM

Revenue Decoupling: a "Tracker"

In its purest form, revenue decoupling is a "tracking" mechanism that adjusts rates and revenues whenever sales deviate from their targeted level (i.e., rate-year sales determined at the last rate case). RD can also represent a form of "attrition allowance," which allows for rate adjustments during the period between general rate cases, that recognizes a utility's earnings eroding during the post-test year period because of billed revenues expecting to fall below authorized revenues. The underlying assumption is that a decline in costs does not offset deficient revenues. In regulatory parlance, attrition refers to a utility's inability to earn its authorized rate of return because of a change in the revenue-cost relationship outside the test year period.

Historically, "trackers" such as RD are justified on the basis of a three-prong threshold test: (1) the designated activity largely lies outside the control of a utility, (2) variations in the outcome of the activity have more than a minimal effect on a utility's earnings, and (3) the actual outcome is likely to deviate from the baseline projections.[44] When applying this test to the activity "sales," it seems tenable to apply a tracker for sales in the form of RD. As discussed above, sales are largely external to a utility's control, and inescapable sales fluctuations can significantly affect earnings. Unless a state commission faces legal restrictions in implementing a "sales tracker" or has a built-in policy of limiting trackers in general, RD would seem to meet the regulatory threshold for a tracker. This should not imply that RD is necessarily in the public interest and defensible as a ratemaking mechanism. As argued below, RD has some downsides (which can be potentially damaging to customers) that a state commission should review

In its purest form, RD is a "tracking" mechanism that adjusts rates and revenues whenever sales deviate from their targeted level.

Historically, trackers such as RD are subject to a threshold test based on utility control, degree of impact, and likelihood of a difference between actual and expected outcomes.

RD seems to meet the regulatory threshold for a tracker.

The RD removes the interest in promoting sales (although this is an odd; if not perverse, departure from the normal corporate modus operandi).

The distinctive feature of RD is that a utility's acutal earnings between rate cases would equal the utility's authorized earnings.

in deciding upon the merits of a RD proposal.

Incentive Effect

For conservationists, RD has the primary feature of neutralizing the utility's incentives for adjusting sales from a baseline level. If, for example, rate year sales are 1000 units, under a pure RD mechanism the utility would be indifferent to whether actual sales are 1100 units or 900 units, as it would be compensated for the lower sales and required to reimburse consumers for the higher sales. This definitely improves upon the situation where the utility has an incentive to promote sales when the commission or state policy perceives the utility as an energy-service company, selling both gas service and energy efficiency. On the other hand, a utility disinterested in sales volumes is an oddity in the confines of corporate *modus operandi*, and, to some observers, a perversity that runs counter to the basic tenets of how markets work and private firms make money.

Illustration of a Revenue Decoupling Mechanism

The simplified example below shows the basic operation of a RD mechanism. Under a stylized RD mechanism, whenever sales deviate from a specified "baseline,"[45] the utility is able to adjust its rates without having to file a formal rate case, so as to earn its authorized earnings (assuming that the utility's actual costs coincide with test year costs).[46]

Let us assume that: (1) the "baseline" sales determined at the most recent rate case equal ten million therms, (2) actual sales equal 9.5 million therms (or 5 percent less than the "baseline" sales), and (3) the distribution margin (or base rate) equals 30 cents per therm. With these assumptions, the revenues at the "baseline" sales equal $3 million (30 cents x 10 million therms), with actual revenues equaling $2.85 million (30 cents x 9.5 million therms). Thus, the revenue shortfall equals $150,000. Under revenue decoupling, rates adjust automatically upward to compensate for this shortfall. Specifically, it achieves this by the following: ΔPrice x 9.5 million therms = $150,000 or ΔPrice = $150,000/9.5 million therms, which equal 1.579 cents (which increases the distribution charge by 5.3 percent). In other words, by increasing the base rate to *31.579 cents per therm* (from 30 cents), the utility would achieve the same revenues of $3 million as if sales were at the "baseline" level. Assuming that the purchased gas cost is 70 cents per therm,[47] in this example the increase in the delivered price of gas to customers would equal 1.6 percent.

The distinctive feature of RD, relative to standard ratemaking, is that the utility's actual earnings between rate cases would equal, or at least correspond more closely to, the utility's authorized earnings. Under standard ratemaking, if the sales decline persists as more than transitory and expected to continue in the future, the utility could only incorporate this decline by filing a rate case.

Some analysts might view RD as a specific form of "rate design." In

TABLE 2
EXPECTED OUTCOMES FROM REVENUE DECOUPLING

Reduced overall risk to the utility	Little effect on incentives for customer-initiated conservation
Less incentive for utility to promote sales, and less disincentive to promote energy efficiency	Increased rate volatility (although probably small relative to the volatility of the gas commodity cost)
Base rates inversely related to actual sales between rate cases	Effect similar to shifting recovery of fixed costs to customer charge, except for possible intra-class subsidy effect
Base rates would tend to be higher (as the utility's average cost would increase, assuming lower sales), although some offset from a possible lower cost of capital)	Uncertain of the risk and overall economic welfare effect on consumers

Source: Author's construct.

standard ratemaking, rate design is the third step in designing rates (the first two are revenue requirement and cost allocation). Rate design involves setting actual billing elements (for example, the customer charge and the volumetric charge) to recover revenues by customer class commensurate with the determined costs allocated to each class. As a rate design, RD would allow a utility to recover the same revenues for distribution service irrespective of actual sales.[48] In effect, RD predetermines how much in revenues the utility will collect from those customer classes subject to the mechanism. This fixity of revenues reduces the risk to a utility from under-recovering its revenues and suffering a cash flow deficiency.

Expected Outcomes from Revenue Decoupling

Table 2 lists the expected outcomes from revenue decoupling. *First, it would obviously reduce a utility's risk from sales fluctuations.* For a utility, this creates more stability in revenues, cash flows and earnings. Under revenue decoupling, for example, revenue volatility for the utility caused by a downturn in the local economy or higher gas prices leading to fewer sales would be less pronounced. Although a utility's overall risk would seemingly decline, exactly by how much would require a sophisticated quantitative analysis. In the order approving Piedmont Gas' revenue decoupling proposal, the North Carolina Utilities Commission said that "Piedmont argues that there is no evidence of reduced risk to shareholders, but the Commission disagrees on the basis of the Company's own case…In a period of declining per-customer usage, a mechanism that decouples recovery of margin from usage, without requiring the utility to file frequent rate cases or increase unpopular fixed charges, clearly reduces shareholder risk."[49] Because of the company's RD mechanism (Rider 8), the Maryland Public Service Commission reduced

Although a utility's overall risk might decline, determining how much would require sophisticated quantitative analysis.

Essentially, the utility would become indifferent to its sales.

If a utility's customers collectively use less gas, rates could rise. But reduced benefits would be small relative to realized benefits.

the authorized rate of return on equity for Baltimore Gas and Electric by 50 basis points to reflect reduced revenue risk for the utility.

Second, revenue decoupling reduces a utility's incentive to grow its sales, or to offer new services, and, simultaneously, provides a lesser disincentive to promote energy efficiency. Essentially the utility becomes indifferent to the level of its sales, assuming the utility achieves the same earnings irrespective of actual sales. This is probably more valid in the short term. In the longer term, a utility may prefer promoting sales to the extent it helps support new capital expenditures, which are rate based and consequently add to the utility's earnings.

Third, between rate filings revenue decoupling would result in an inverse relationship between the utility's base rate and actual sales. For example, if sales drop because of an aggressive effort by the utility to promote energy conservation, under revenue decoupling this would increase the base rate in the absence of a rate filing.

Fourth, as a corollary to fewer sales resulting, the utility's short-run average cost for non-gas service would tend to be higher.[50] Logically, as fixed costs cover less sales, average cost would rise. The assumption of lower sales seems valid even if the utility has no special energy-efficiency initiatives; the reason is that RD would make the utility less motivated than otherwise to increase its sales through promotional practices. Since non-gas service reflects a fixed cost business, any sales decline induced by revenue decoupling would have little effect on a utility's short-run non-gas costs. This outcome is implicit under a RD mechanism, as rates adjust upward to compensate for the utility's higher average cost stemming from fewer sales.

Fifth, RD would probably have little effect on customer-initiated energy efficiency.[51] The benefits to a customer from using less natural gas sums to the delivered price (i.e., the base rate plus the purchased gas costs) times the amount of gas saved. For an individual customer consuming less gas, RD would have a miniscule effect on a utility's rates. In other words, the presumption here is that an individual customer curtailing her use of natural gas by itself would have no visible effect on rates since the lost revenue to the utility would be imperceptible relative to total revenues. On the other hand, if a utility's customers collectively consume less gas, this could cause rates to rise. In this event, the benefits to individual customer from energy conservation could somewhat decline, but even here the reduced benefits would be small relative to the size of the realized benefits. In recent years, for many utilities the base rate for natural gas to residential customer has fallen to less than 30 percent of the total delivered price.[52] Assuming that RD causes the base rate to increase by 2 percent with the base rate representing 30 percent of the delivered price, customers would see an aggregated rate increase of 0.6 percent.[53] Consequently, customers would realize 0.6 percent less benefits from energy conservation.[54] As argued above, however, an individual customer contemplating conservation would unlikely take into account the rate increase that might ensue.[55]

Sixth, revenue decoupling might cause rates to be more volatile, as the base rate could change annually. Nevertheless, compared (say) to the volatility of purchased gas, any rate adjustments from a RD mechanism would likely be minimal. Between 2003 and 2005, for example, in the United States the residential price for natural gas rose at an annual rate of around 15 percent.[56] If, as in the above illustration, RD caused an annual increase of 0.6 percent in the residential price (or 2 percent in the base rate), the overall effect on customers of a RD-driven rate adjustment appears relatively small.

Seventh, revenue decoupling would have an effect similar to a rate design change that shifts the recovery of all fixed costs to the customer charge.[57] One variation might include a different effect on individual customers within a certain class. For example, assuming that any rate adjustment affects the volumetric charge, those customers consuming relatively more natural gas than other customers in the same class might be worse off with a RD than under a straight fixed-variable rate design.

Eighth, whether or not revenue decoupling would benefit customers is uncertain. Customers can benefit when they face lower risks (for example, less volatile gas bills) or when RD induces the utility to spend more dollars on energy efficiency initiatives and be more effective in carrying out these initiatives. With an added incentive to promote energy efficiency, the utility's rates would tend to be higher than under standard ratemaking; this could harm those consumers who have to pay higher rates but do not participate in any of the utility's energy efficiency programs.

Overall, whether RD benefits customers is uncertain.

Defining risk in terms of customer-bill variability, RD could cause risk to increase.[58] As an example, if the delivered gas price rises by 20 percent, and assuming a price elasticity of -0.10 (or less than one in absolute terms), customers' bills would increase. With fewer sales, under RD the utility would adjust its base rate, aggravating the burden on customers. In another example where abnormal weather occurs, RD can actually reduce customer risk. Specifically, if colder-than-normal weather occurs, customers' bills would not rise as much: under RD, bills would be lower because of higher actual sales translating into a downward adjustment of base rates. In this case, RD would have a hedging-type effect from reduced volatility of customers' bills. As a last example, under RD fewer sales resulting from an economic recession would cause customers to pay higher rates at a time when many might be facing financial hardship.[59] Overall, the direction of the risk change to customers from RD depends on the source of sales fluctuations.

Defining risk in terms of variability of customer bills, RD could cause increased risk.

DIVERGENT VIEWS ON REVENUE DECOUPLING

In state commission across the country, parties have offered various arguments on the merits of RD.

In state commission proceedings across the country, different parties have offered several arguments on the merits of RD. These parties include supporters, skeptics, and opponents of revenue decoupling. This section presents a list of arguments without judging their merits. The list was complied from a review of testimony, commission orders, briefs and other documents filed in either rate cases or other regulatory proceedings. The following section of this briefing paper will closely examine several of the arguments.

The Advocates

Among other arguments, advocates of RD say rate cases, which are expensive, would become less frequent.

The major arguments presented by parties, usually gas utilities and conservationists, in favor of revenue decoupling are as follows:

- A small reduction in gas sales can affect significantly a utility's earnings
- Under standard ratemaking, energy efficiency initiatives harm utility shareholders between rate cases. The accumulation of earnings losses over the period between rate cases can be significant.[60]
- It is unfair to have a utility promote energy efficiency when it harms its shareholders, as the utility has a fiduciary responsibility to its shareholders in maximizing returns
- Rate cases, which impose significant costs on utilities and commissions, would become less frequent over time[61]
- Standard ratemaking steers a utility away from initiating energy efficiency actions, some of which may be cost-effective; or, when forced to promote energy efficiency activities, utilities will do so lackadaisically. RD is therefore critical to assure that utilities effectively carry out energy efficiency initiatives.
- A utility is entitled to a reasonable opportunity to recover fully its previously authorized fixed costs between rate filings, even when energy efficiency initiatives and other factors adversely affect revenues over this period
- Unless state commissions recognize the trend of falling gas use per customer in base rates, earnings will inevitably fall below authorized levels. Even if the utility is able to lower its costs between rate filings, it may not have a reasonable opportunity to earn its allowed rate of return.
- Unless state commissions are willing to remove fixed costs from the volumetric charge, RD is the only viable alternative in protecting shareholders' interest from fluctuating sales
- RD can actually reduce risks to consumers by suppressing gas bill volatility[62]
- RD eliminates a major controversial issue in rate cases, namely, the calculation of test-year sales[63]

- As an alternative to RD, lost revenue adjustment (LRA)[64] from energy efficiency initiatives would require evaluation and verification of savings from utility-initiated energy conservation programs.[65] Under LRA, an incentive problem arises where a utility would have an incentive to maximize measured or reported savings but to achieve minimal actual savings from energy efficiency initiatives.
- By stimulating energy efficiency initiatives, RD can benefit both gas consumers and society in the long run (for example, lower consumer gas bills from the pursuit of these initiatives)[66]
- The ability of a utility to recover its fixed costs should not hinge on its actual sales, over which the utility has little control[67]
- Full recovery of fixed costs in the customer charge would reduce the incentive of customers to conserve since, at the margin, customers would save less money from curtailing their gas usage
- RD could reduce overall gas demand, thereby placing downward pressure on wholesale gas prices
- RD is easy for state commissions to monitor
- RD improves a utility's financial situation and lowers its risk from the perspective of the financial community
- RD is critical in transforming a utility from a seller of least-cost gas service to a provider of least-cost energy services
- RD does not affect a utility's incentive to minimize costs and pursue operating efficiencies[68]

The Skeptics and Opponents

On the other side of the debate are those who have raised several concerns about revenue decoupling, with their arguments enumerated below:

- In theory and practice, regulation does not guarantee a utility to earn its authorized rate of return because of increased competition, economic trends, and changes in consumption behavior (for example, reduced sales because of high prices) and technology that may move against the industry or an individual gas utility
- Existing conditions do not warrant a true-up mechanism that passes on risks to gas consumers (i.e., extraordinary conditions do not exist)[69]
- Consumers unequivocally bear higher risks
- Declining gas use per household might not persist in the future to affect significantly the ability of a utility to earn its authorized rate of return. Besides, a rate case is the proper forum for determining whether the decline in per customer gas use will continue and, if so, how it should affect new rates.
- No evidence exists to support RD as necessary for the successful implementation of utility-funded energy efficiency initiatives[70]
- Singling out revenues for "tracker" ratemaking treatment without considering deviations in actual and test-year revenue requirements represents faulty ratemaking[71]

Skeptics say regulation does not guarantee a utility will earn its authorized rate of return, including for reasons of changes in consumption behavior.

Among other arguments against RD, opponents say it is a blunt tool because it does not take into account reasons for declining sales.

Some of the same arguments are being made on both sides of the RD debate.

Consumer groups might support RD as part of a settlement where a utility agrees to specific concessions.

- Better, more incremental alternatives are available for addressing the problem of reduced sales per customer
- RD is a backdoor approach by utilities to recover their fixed costs
- RD can lower the quality of utility service[72]
- RD can destabilize rates on a year-to-year basis
- A core function of a gas utility should not include the promotion of energy efficiency[73]
- RD can reduce customer incentives for conserving natural gas[74]
- RD represents a blunt tool by allowing for rate adjustments irrespective of the reason for a decline in sales
- By itself, RD does not provide any positive incentive to a utility to promote or support energy efficiency initiatives
- RD will tend to increase short-term gas prices, as the lower sales induced by the mechanism cause an upward adjustment in the base rate
- RD could thwart economic development[75]
- RD is more difficult to administer than alleged by proponents

ANALYSIS OF MAJOR ARGUMENTS

As evident from the above lists, several arguments lie on both sides of the RD debate. Tables 3 and 4 identify individual arguments from the standpoint of their persuasiveness ("strong" or "weak") in supporting the different positions on revenue decoupling. The discussion below elaborates on these assessments in addition to making additional observations, some introduced previously.[76]

Reaction to RD

State commissions have responded differently to RD, while consumer groups in general have opposed RD.

Consumer groups mostly disfavor the risk shifting aspect of RD and the expectation that rates will increase in the short term. Some industrial groups question whether utilities should be involved at all in promoting energy efficiency.[77] While these groups are correct in asserting that a utility's risk would decline, it is unclear whether consumers would bear more risk (see above). Consumer groups might support RD if it is part of a settlement agreement where a utility agrees to specific concessions. These concessions can include a commitment by the utility to spend a fixed amount of money on promoting energy efficiency, a transfer of monies to an independent entity to administer conservation programs, and agreement by the utility to lower its authorized earnings because of reduced risk.

TABLE 3
AN ASSESSMENT OF ARGUMENTS SUPPORTING REVENUE DECOUPLING

Strong Arguments	Weak Arguments
Necessary, if not sufficient, for a utility's financial interest in promoting effectively energy efficiency	Reduced risk to customers
Strong utility profit motive under standard ratemaking for promoting sales (assuming energy-efficiency promotion is an explicit commission or state policy)	Definite benefits to customers
Sales largely exogenous to a utility's control	A higher customer charge reducing significantly the incentive for customer-initiated energy efficiency
Historical decline in gas use per residential customer generally not taken into account in setting new base rates	More energy efficiency causing a decline in the market price of gas
High sales volatility from year-to-year causing possible significant deviations from targeted sales and earnings	Absolutely necessary for aggressive utility energy-efficiency initiatives
Short-run delivery costs largely fixed	Ease in design
Strong opposition to allocating all fixed costs to the customer charge	Necessary for a utility to earn its authorized rate of return
Potential for energy efficiency to benefit customers	
Reduced risk to the utility	
Less contentious than a lost revenue adjustment (LRA) mechanism	

Source: Author's construct.

TABLE 4
AN ASSESSMENT OF ARGUMENTS IN OPPOSITION TO REVENUE DECOUPLING

Strong Arguments	Weak Arguments
Need to demonstrate special conditions for true-up recovery of revenues	Uncertainty over a future decline in use per customer
Inappropriate to single out revenues for true-up adjustments	Lower utility service quality
Less likelihood of addressing rate-design problem	More price volatility
More certainty of utility benefits than customer benefits	Reduced incentive for customer-initiated energy efficiency
Upward pressure on short-term prices, as a utility's average cost for delivery is likely to increase	Unequivocally increased customer risk
Incremental options should be considered	Feasibility of alternative initiatives
Possible legal/policy precedent issues	Preference for lost revenue adjustment (LRA) mechanism
Overly broad in addressing the problem at hand	

Source: Author's construct.

Throughout their history, state commissions have been reluctant to approve of trackers unless special conditions exist.

Evidence of performance of RD on balance points to positive results.

"Tracker" Mechanism

State commissions should view RD as a true-up mechanism or a "tracker."

As I have noted, as a tracker RD seems to meet the minimum criteria applied historically by state commissions in other areas of a utility's operation with approved trackers. Throughout their history, state commissions generally have been reluctant to approve of trackers in ratemaking unless special conditions exist.

Compatibility with Regulatory Objectives and Ratemaking Principles

RD would produce outcomes that are both compatible and incompatible with ratemaking principles and generally accepted regulatory objectives.

Applying these criteria (for example, Bonbright's eight criteria for setting rates[78]), the positive features of RD include: (1) increased opportunity for a utility to earn its authorized rate of return,[79] (2) more revenue stability, (3) removal of disincentives for a utility to promote socially desirable energy-efficiency initiatives, and (4) elimination of a major contentious aspect of a general rate case.

The negative features of RD that emerge include: (1) a potential public-acceptability problem (for example, consumers complaining that a utility can increase rates simply because its sales have fallen), (2) more volatile and unpredictable rates,[80] (3) reduced interest in designing more efficient rates (discussed later), (4) reduced incentive for a utility to offer innovative new service options and rates, (5) reduced utility promotional activities that might be economical, (6) introduction of another tracker mechanism to ratemaking that can shift risks to consumers, and (7) possible reduced overall economic efficiency.

Uneven Certainty of Benefits to Different Parties

The benefits of RD to gas utilities are more definitive than the benefits to consumers in both the short and long term.

As discussed above, RD reduces a utility's overall risk while the benefits to consumers are less transparent and more circular (for example, to the extent RD promotes cost-effective, utility-initiated energy efficiency, consumers may realize a benefit). When RD reduces a utility's risk, consumers can benefit in the long term, for example, from a lower authorized rate of return.[81]

Evidence of Performance

The limited evidence on the ex post performance of RD mechanisms for gas utilities on balance points to positive results.

From the perspective of a senior staff member of the Maryland Public Service Commission, the Baltimore and Gas RD mechanism (Rider 8) has achieved the intended goals since its inception over seven years ago. Specifically, it has: (1) produced more stable and predictable revenues for the utility between rate cases by accounting for revenue "attrition" caused by declining gas use per customer, (2) reduced the volatility of gas bills, especially under cold weather conditions, and (3) allowed for the continuation of current rate designs that provide an incentive for consumers to conserve and that are non-discriminatory to low usage customers. The staff person also added that the RD mechanism is easy for the utility to administer and the commission to monitor. Overall, the staff member concluded that the mechanism has "[fulfilled] more regulatory objectives with fewer shortcomings than other alternatives."[82]

A study conducted for Northwest Natural concluded that: (1) by reducing revenue fluctuations, the Distribution Margin Normalization (DMN) mechanism has reduced the utility's business and financial risks, (2) DMN margin adjustments can largely be attributed to the effect of price changes, with economic activity and the utility's funded energy efficiency efforts having a statistically insignificant effect on use per customer, (3) the utility's focus has shifted from marketing to promoting energy efficiency, (4) service quality did not decline, and (5) most of the risk reductions experienced by the utility were eliminated rather than shifted to customers. While making several recommendations for improving Northwest Natural's DMN mechanism (for example, full decoupling), the study concluded, "The positive effects of DMN outweigh the negative effects."[83] To date, this study represents the most comprehensive and analytical *ex post* investigation of a RD mechanism for gas utilities.[84]

Alternative Mechanisms

Alternatives to RD in achieving the same objectives might be preferable, as RD is a more blunt approach than most alternatives.

These alternatives can include: (1) raising the customer charge by removing fixed costs from the volumetric charge, (2) implementing or expanding weather-normalization adjustments, (3) implementing declining block rates, (4) using a multi-year forecast horizon in setting new rates, and (5) implementing a targeted incentive plan which allows a utility to profit from successfully carrying out socially desirable energy-efficiency initiatives. Since each of these alternatives has its own drawbacks, a state commission might want to assess their desirability compared with a RD mechanism.[85]

State commissions might want to assess several alternatives to RD, although each of those has its own drawbacks.

Legal/Policy Questions

For some state commissions, the legality of RD as well as its compatibility with policy precedent may be an issue.

Legality of RD may be an issue in some states.

This was the case, for example, in both Minnesota and North Carolina. In Minnesota, the state's Department of Commerce argued that the RD proposal by Xcel violates state statutes, which in its opinion do not provide a statutory exception for a true-up mechanism that adjusts rates based on the level of gas use per customer. In North Carolina, two commissioners dissented from a commission order approving a RD mechanism for Piedmont Natural Gas by arguing, *In considering RD, a state commission needs to include design and implementation, as well as policy issues.*

among other things, that the mechanism violates North Carolina law by reflecting retroactive ratemaking.[86] The dissenters also argued that as a matter of policy state commissions have approved true-up mechanisms only under "extraordinary circumstances," which they contend did not apply in the case of declining gas use per customer. In first considering a RD proposal, a state commission should review its legal authority in addition to policy precedent in allowing for a true-up between rate cases based on actual sales relative to "baseline" sales established at the time of the previous rate case.

Implement/Design Issues

A state commission needs to address several design and implementation issues, assuming that the concept of RD has broad stakeholder support.

Is a gas utility in the business of selling natural gas, or, more broadly, the busienss of selling energy services that include conservation?

These include: (1) scope of the mechanism in terms of factors (for example, weather and price elasticity) that should be included in determining sales adjustments, (2) rate classes affected, (3) frequency of rate adjustments, (4) the need for a rate-adjustment cap (for example, limit annual rate adjustment to 5 percent of the base charge), (5) revenue adjustments from new customers, (6) treatment of any cost-of-capital effect, (7) pilot or permanent status,[87] (8) accounting for overall utility earnings by considering cost changes over time, (9) proper forum for consideration (rate case filing, special docket), (10) accounting for quality-of-service effects, (11) adjustment to specific rate components (for example, the volumetric charge or the customer charge), and (12) true-up of prior period RD adjustments.

One Rationale for RD

The merits of RD crucially depend on the state commission's vision of a gas utility in promoting energy efficiency in addition to its core function of selling and delivering natural gas.

In considering RD, a state commission might first want to consider whether a gas utility should be in the business of selling natural gas and delivery service or, more broadly, of selling energy services, which include energy conservation. If the latter is preferred, then RD becomes a more tenable ratemaking tool.[88] If not, then a commission should assess RD in terms of the "declining gas use per customer" phenomenon. In other words, if a state commission requires a gas utility to promote aggressively energy efficiency, or if there is strong evidence of large benefits from utility-funded energy efficiency initiatives, RD has definite merits as a ratemaking mechanism.[89]

Regulators should not expect utilities to undertake pro-actively energy-efficiency initiatives that lead to deterioration of shareholder interests.

Regulators should not expect a utility to undertake pro-actively energy-efficiency initiatives when shareholder interests deteriorate. A collision course leading to unintended consequences seems inevitable under standard ratemaking from requiring a utility, whose earnings directly relate to the level of sales, to play an independent active role in reducing its sales. Furthermore, if a commission approves RD, it could require a utility to be committed to promoting aggressively energy efficiency.[90]

A Second Rationale for RD

In addition to promoting energy efficiency initiatives, RD may also be defensible.

Specifically, three conditions would support RD. First, a state commission believes that consumption per customer is likely to decline in the future. Second, the utility's ability to add new customers in growing sales is greatly limited. Third, the commission's discretion to recognize declining consumption per customer in setting base rates is constrained because of statutory or commission restrictions on pro forma adjustments to include only "known and measurable changes" to a historical test year.[91] If cost recovery, namely, recouping earnings losses from an unexpected decline in sales per customer, is the main rationale for RD, as discussed above a state commission has other options available to address this problem.

Negative Economic-Efficiency Effects

From an economic-efficiency perspective, RD has some negative attributes.

One, as discussed earlier, stems from the expectation that RD would cause a utility to shift farther away from the minimum point of its short-run average cost curve, assuming that the mechanism will result in lower sales than otherwise. Since gas distribution is essentially a fixed cost function in the short run, higher average cost would result from reduced sales, since by definition average cost equals total cost divided by sales. In addition, a point made above, RD makes the utility indifferent to increasing sales even if it would be economical. For example, if the base rate is 50 cents per therm and the short-run marginal cost for gas distribution service is zero, under a RD mechanism the utility would have no incentive to increase sales even though it would clearly be economical to do so. This outcome is contrary to the universal corporate objective of spreading fixed costs over additional sales to produce greater operational efficiencies.

Another conceivable source of economic inefficiency derives from the presumption that a utility with a RD would have little or no incentive to modify its rate design by removing more of its fixed costs from the volumetric charge, which if nothing else would remove what some analysts consider a major source of prevailing price inefficiency in the utility sector.[92] With RD protecting a utility's financial condition from sales volatility, there would seem to be little payoff to the utility from initiating any subsequent change in rate design that removes fixed costs from the volumetric charge. In addition, RD would tend to exacerbate pricing inefficiency by widening the gap between price and marginal cost for non-gas service whenever sales fall below the specified "baseline."[93]

With RD, there would be little payoff to the utility from initiating any subsequent change in rate design that removes fixed costs from the volumetric charge.

An earnings sharing mechanism has the attractive feature of treating symmetrically costs and revenue deviations.

Accounting for Price Elasticity

State Commissions should recognize the price-elasticity effect on future gas consumption when setting new rates, or example, by liberalizing their interpretation of "known and measurable change."

As shown above, with the dramatic increase in natural gas prices over the last few years, and even with only a small price-elasticity response by consumers, the effect on a utility's earnings can be significant.[94] Because of the high uncertainty over the effect of the recent natural gas price increases on consumption, a true-up mechanism such as revenue decoupling may have added merit.

Earnings Sharing as an Alternative

If a state commission is concerned that a utility will not have a reasonable opportunity to earn its authorized rate of return, short of filing a rate case, it should consider an earnings-sharing approach, rather than adjusting rates solely because of "unanticipated" sales.

Actual costs are likely to differ from test-year revenue requirements for many reasons.[95] It may be inappropriate, therefore, to adjust rates when actual sales deviate from "baseline" or test year sales while not making adjustments for expenses and other revenue-requirement components of the base rate. For example, between rate cases all of the cost savings from productivity improvements not anticipated at the time of the last rate case, would flow to a utility's shareholders. An earnings-sharing mechanism has the attractive feature of treating symmetrically costs and revenue deviations. Under RD, it is conceivable for a utility to have both its base rate adjusted upward between rate cases in response to a decline in sales per customer and, at the same time, earning a rate of return above the authorized level because of actual expenses reduced below the test year estimates. One of the shortcomings of an earnings-sharing mechanism, however, is that the utility's shareholders could still suffer from lower sales to the extent they absorb a portion of the realized earnings losses.[96] Thus, the utility would have a disincentive, as under standard ratemaking, to foster energy efficiency.

SUMMARY AND CONCLUSIONS

While generally supportive of RD, gas utilities and conservationists tell different stories about why.

Over the past few years, champions of revenue decoupling mechanisms have included conservationists and gas utilities. The federal government has become more active in reviewing this ratemaking tool for both electric and gas utilities, for example, pursuant to EPAct of 2005, and other governmental entities have endorsed or are examining RD as well. While generally supportive of RD, gas utilities and conservationists tell different stories on the desirability of this ratemaking mechanism.

Other stakeholders in the state regulatory process have expressed several concerns with RD. State commissions themselves have responded differently to the desirability of RD as a ratemaking mechanism. Unquestionably, RD helps to preserve the financial integrity of utilities and motivate them to be less opposed to promoting energy efficiency. Whether RD would benefit consumers is less certain. It is partially for this reason that the debate over RD mechanisms at the state level, to date, has centered on conceptual and theoretical issues, specifically on whether RD offers consumers any advantages over the standard ratemaking standard approach and is compatible with prevailing regulatory objectives.

The central point of this briefing paper is that state commissions should consider RD for those gas utilities required or pressured to promote aggressively cost-effective, energy-efficiency initiatives. RD would reduce the incentive for a utility to undertake ineffective energy-efficiency initiatives in addition to overcoming the predicament of a utility in implementing those initiatives when it would adversely affect its shareholders. One corollary of this is that if a state commission allows RD, it may want to consider requiring a utility to engage in serious energy efficiency efforts by spending more-than-minimal dollars on energy efficiency and undertaking all cost-effective initiatives.

RD may also have merit if a state commission is uncertain of future gas consumption and believes that gas use per customer will likely continue to decline in the future, for example, because of the elasticity effect from high gas prices. The commission might be constrained from accounting for this phenomenon in setting new rates because of the lack of evidence justifying a "known and measurable" adjustment. In this case, RD would act as an attrition allowance protecting a utility's earnings between rate cases from less-than-expected gas consumption.

State commissions and consumer groups have rightly raised concerns about some of the negative features of RD. One generally expressed misgiving with RD is that, while necessarily beneficial to the utility in reducing its risk, it might be inimical to consumers. Some skeptics view RD as akin to taxing consumers for the benefit of protecting utilities from financial harm when revenues fall short of some predetermined level. While this perception arguably is a misrepresentation, it may lie at the heart of the equivocation by state commissions and consumer groups to this ratemaking mechanism. At the least, the concern with RD may require a utility to appease the doubters by committing to energy efficiency or by agreeing to a downward adjustment of its authorized rate of return on equity as compensation.

The central point of this briefing paper is that state commissions should consider RD for those gas utilities required to promote aggressively cost-effective, energy-efficiency.

Overall, the jury is still out on how state commissions will rule on RD proposals in the future. If commissions view gas utilities as purveyors of energy efficiency services, they will likely be more receptive to a mechanism that would keep utility shareholders financially whole in addition to removing any disincentive for a utility to promote actively those presumably socially desirable services. After all, if RD results in only slightly higher rates, but achieves large benefits – or at least the perception of large benefits to consumers from utility-funded, energy-efficiency activities – the public will look more favorably upon the commission and utility in their endorsement of this ratemaking mechanism.

Notes

[1] This rate design initiated decades ago with a major objective of motivating gas utilities to sign up new customers and to increase their sales. Until the dramatic rise in gas prices around 2000, public policy and utility actions were generally supportive of growing gas sales. That posture no longer holds, as the emphasis in the last few years has shifted toward controlling growth in gas sales.

[2] In recent years, state commissions have seen the filing of numerous rate cases by gas utilities. These filings, for some utilities the first in over a decade, are the result of eroding profits caused by a combination of higher costs, required capacity expenditures (partly the result of customer growth and new safety regulations), and flat demand growth. In many of these rate filings, the utility petitioned for a change in rate design, notably the shifting of fixed costs from the volumetric charge to the customer charge.

[3] Gas utilities have assigned different labels to their revenue decoupling (RD) proposals: Conservation Margin Tracker, Conservation-Enabling Tariff, Conservation Tariff, Conservation Rider, Conservation and Usage Adjustment Tariff, Conservation Tracker Allowance, Margin per Customer Balancing Provision, Delivery Margin Normalization, Usage per Customer Tracker, Customer Utilization Tracker.

[4] The financial community has also looked favorably upon revenue decoupling in reducing a utility's risk and improving its financial stability.

[5] In several presentations over the past couple of years, AGA has argued that RD can: (1) reduce natural gas consumption over time, (2) lower bills to consumers, (3) increase utility-funded energy efficiency initiatives, and (4) provide a reasonable opportunity for a utility to earn its authorized rate of return. Specifically, AGA has argued that RD can benefit consumers by: (1) lowering gas consumer bills over time, (2) reducing uncol-lectible bills, and (3) reducing overall gas demand that will place downward pressure on market gas prices. (See, for example, Roger Cooper, "Creating a Win/Win Natural Gas Distribution Energy Efficiency program: Recognizing and Aligning Stakeholder Interests," presentation at the Indiana Utility Regulatory Commission Gas Issues Forum, July 29, 2005.)

[6] See *Joint Statement of the American Gas Association and the Natural Resources Defense Council*, submitted to the National Association of Regulatory Utility Commissioners, July 2004.

[7] See National Association of Regulatory Utility Commissioners, "Resolution on Energy Efficiency and Innovative Rate Design," adopted Nov. 16, 2005.

[8] See Russell A. Feingold, "Decoupling, Conservation, and Margin Tracking Mechanisms – An Overview," AGA Rate and Regulatory Issues Audio Conference Series, Oct. 27, 2005.

[9] As noted by Eric Hirst in a 2004 report prepared for Idaho Power Company, titled *Decoupling for Idaho Power Company*, "During the 1990s, various forms of decoupling were deployed in Maine, New York, California, and Washington [for electric utilities]. During the mid-1990s, these efforts were largely abandoned as utilities and state regulators anticipated a restructured, competitive electricity industry, although Oregon began decoupling in the late 1990s" (at 3).

[10] California is the only state that has embraced RD for electric utilities. The state initially instituted RD in the state in the 1980s partially because of evidence of a fuel oil shortage, and near doubling of oil prices and interest rates; the expectation was a decline in electric utility sales in response to these events. Incidentally, in California RD is currently under consideration for water utilities largely to encourage utility-funded energy conservation efforts.

[11] Pacific Gas and Electric was the first gas utility subject to a RD, starting in 1978. The state commission rationalized the mechanism by the fear of gas curtailments and the expected erosion of earnings from the combination of lower sales and inverted rates. (See Bruce Smith, "Revenue Sales Adjustments," presentation before the Harvard Electricity Policy Group, March 3, 2005.)

[12] The Baltimore Electric and Gas mechanism (Rider 8) measures test-year base rate revenues after adjusting for any change in the number of customers from the test-year level. The mechanism adjusts test-year revenues by accounting for the net number of customers added since the test year. The difference between actual revenues collected and the recalibrated test-year revenues determines the rate adjustment. In effect, the mechanism is a "true-up" that accounts for customer growth as this element could offset lower per-customer gas usage the mechanism is intended to capture.

[13] The Southwest Gas mechanism, designed as a margin tracker, balances actual margin revenues to authorized levels. The California Public Utilities Commission approved this mechanism in 2004.

[14] The staff of the Oregon Public Utility Commission supported Northwest Natural's original RD mechanism only after the utility agreed to implement a service quality standard and to transfer permanently the utility's energy conservation programs to a selected independent entity approved by the commission.

[15] North Carolina Utilities Commission, *Order Approving Partial Rate Increase and Requiring Conservation Initiative*, Docket Nos. G-9, Sub 499, G-21, Sub 461 and G-44, Sub 15, Nov. 3, 2005, at 23-24. Chuck W. Fleenor filed company testimony in support of CUT on April 1, 2005.

[16] Ibid. 24.

[17] See Vectren Energy Delivery of Ohio, *Application of Vectren Energy Delivery of Ohio, Inc. for a Conservation Rider*, Case No. 05-1444-GA-UNC, Nov. 28, 2005, 4.

[18] See the testimony of Dr. George R. Compton, Docket No. 05-057-T01, Jan. 23, 2006, at 11.

[19] See Quote.com, *Business Wire*, "South Jersey Proposes Innovative Conservation and Usage Tariff; Measure Will Help Customers Save Energy and Lower Heating Bills," Dec. 5, 2005.

[20] The legislature required the commission to investigate how decoupling the earnings of gas and electric utilities from their sales can best promote the state's energy policy.

[21] The Connecticut Department of Public Utility Control, *DPUC Investigation into Decoupling Energy Distribution Company Earnings from Sales*, Docket No. 05-09-09, Draft Report, Jan. 12, 2006. In addition to sales and per customer adjustment clauses, the study defines decoupling as also encompassing a conservation and load management adjustment clause and rate design changes that reduce the effect of sales changes on a utility's earnings.

[22] The Department used the term "business risk" in explaining how a revenue-decoupling plan would reduce the risk of a utility from sales fluctuations. Generically, business risk refers to the uncertainty linked to the operating cash flows of a business. Business risk is multi-dimensional, inclusive of both sales risk and operating risk. Some analysts may categorize this risk as "regulatory risk," which relates to a regulator's actions that affect a utility's ability to earn a fair rate of return. For RD, regulatory risk may arise from the uncertainty associated with the recovery of revenue deferrals (i.e., the difference between actual revenues and targeted revenues, accumulated over time).

[23] The Department found that "Past experience has shown that customer-initiated conservation by gas LDC customers can yield usage reductions of up to 3.5 percent annually in response to high prices" (Ibid. 19).

[24] The Attorney General argued that a revenue decoupling mechanism would reduce customers' incentive to conserve.

[25] In Minnesota, the state's Department of Commerce and Office of Attorney General challenged a RD mechanism proposal by Xcel. The utility subsequently withdrew the proposal as part of a rate case settlement. Arguments in opposition to the utility's proposal included: (1) it is questionable whether the absence of RD would deprive the utility of a reasonable opportunity to earn its authorized rate of return, (2) the proposal violates state statutes, (3) the proposal removes the incentive of a utility to forecast sales accurately in a rate case, (4) it was unsubstantiated whether gas use per customer will continue to fall in the future, and (4) under the proposal, the utility could adjust its rates upward even if declining gas use per customer is offset by an increase in the number of customers. (See Vincent C. Chavez, *Direct Testimony and Exhibit*, before the Minnesota Public Utilities Commission, Feb. 11, 2005.) In 2005, the Nevada Public Utilities Commission rejected a RD proposal by Southwest Gas, arguing in part that the proposal would constitute a major change from current ratemaking practices and before it can be justified "more recognized alternatives" (such as changes in rate design and more frequent rate filings) should be applied to the perceived problem (i.e., reduced earnings from less-than-expected gas sales) (Nevada Public Utilities Commission, Opinion, Docket No. 04-3011).

[26] Southwest Gas proposed a "Conservation Margin Tracker" in anticipation of a continuation of the past trend of declining gas use per customer.

[27] Arizona Corporation Commission, Opinion and Order (Decision No. 68487), Feb. 23, 2006.

[28] The published study provided no explanation how normalized consumption was calculated. While presumably AGA applied a proper methodology to normalize actual consumption, a reader of the study is unable to verify independently.

[29] The AGA study estimated that almost half of the decline per household since 1997 resulted from space-heating efficiency gains.

[30] The study attributes a slower decline in usage per customer in the future to the construction of larger houses and the expectation of only modest furnace efficiency gains. (See American Gas Association, *Forecasted Patterns in Residential Gas Consumption, 2001-2020*, EA 2004-04, Sept. 21, 2004.) Reduced consumption per customer does not imply that utilities' total gas sales to residential customers will fall in the future (see, for example, Energy Information Administration, *Annual Energy Outlook 2006*, February 2006 and other projections). Most studies expect moderate growth in total residential sales over the next several years, even in view of a continued decline in sales per residential customer (with growth varying by state and region). This means that utilities' revenues from residential sales should grow between rate cases because of the addition of new customers, notwithstanding a decline in use per customer.

[31] According to a 2005-RAND study, titled *Regional Differences in the Price-Elasticity of Demand for Energy*, the demand for natural gas and electricity is relatively price-inelastic; in the past 20 years, this relationship has not changed significantly, as analyses performed in the 1980s showed generally the same result. Nevertheless, as the study argues, because prices were declining in real terms over most of the period studied, inelasticity of demand may be a product of the absence of price increases. The study, applying data for the period 1977-2004 to econometric methods, estimated the short-run price elasticity of demand for residential natural gas as equal to -0.12 and the long-run price elasticity as -0.36. Although the results confirmed price-inelastic demand, as illustrated elsewhere in this paper consumers' response to sharply higher gas prices can nevertheless have a significant effect on a utility's short-term earnings.

[32] The implicit argument by gas utilities is that, from a revenue perspective, the growth in the number of customers does not offset declining gas per customer, resulting in total actual revenues less than the test-year revenues.

[33] Larger declines may be occurring in areas with a high growth of new housing construction, with the reasoning that new homes on average are more energy efficient and use less energy than older houses.

[34] For the electric industry, where some utilities have proposed RD, the historical phenomenon of declining use per customer does not hold (use per customer has continuously increased over time), making less tenable the adoption of RD for this industry unless a stronger case can be offered for electric utilities to promote energy efficiency than for gas utilities.

[35] Options for utilities to address declining usage per customer include raising the customer charge, implementing declining block rates, using a multi-year forecast horizon, and innovative strategies, such as revenue decoupling. These alternatives may pose political, policy or legal obstacles that make revenue decoupling the only viable and attractive alternative. For example, an adjustment made to account for declining usage per household would be feasible under a future test year but would be more difficult to justify under an historical test year.

[36] Many state commissions that apply histori-cal test years in rate cases allow utilities to adjust their sales forecasts for weather normalization. Other state commissions apply forecasted test years, with the allowance of weather-normalized sales projections. Weather-normalized sales projections arguably allow a gas utility a reasonable opportunity to meet its forecasted sales between rate cases.

[37] Normally when a commission sets an authorized rate of return, it specifies a zone of reasonableness within which the commission considers a rate of return to be fair. For example, a commission may rule that a reasonable rate of return lies between 9 and 11 percent, with 10 percent, the mid-point, as the authorized rate of return.

[38] Most industry observers presently see the changed post-1999 market conditions as structural, with sustained effects, rather than cyclical. They expect no significant relief in natural gas prices until 2008 or later. In contrast, price spikes experienced in the 1990s were short-lived, caused largely by brief periods of unusually cold weather or regional pipeline bottlenecks. In terms of the effect on the economy, most analysts see the combination of high natural gas and oil prices slowing down short-term economic growth in addition to exacerbating inflationary pressures.

[39] Under a straight fixed-variable (SFV) rate design, a customer charge includes 100 percent of the fixed costs and the volumetric charge contains only those costs that vary with sales. One outcome of this rate design is that whenever a utility experiences lower or higher sales, the utility recovers the same amount of its fixed costs. In other words, its rate of return remains the same. Relative to alternate rate designs (with the exception of revenue decoupling), SFV reduces the utility's risk, with the recovery of fixed costs "up-front," irrespective of actual gas sales.

[40] Exceptions may include variable non-gas costs. Examples include winter high-pressure service, as the sizing of high-pressure facilities correlates with demand under extreme weather conditions, and the foregone revenues from storage services sold off-system. (See, for example, Hethie S. Parmesano, testimony before the Illinois Commerce Commission, on behalf of NICOR Gas Company, November 2004.)

[41] This assumes the fixity of all non-gas costs, thus invariant to changes in sales.

[42] It is assumed that R* was determined in the last rate case and the source of equity capital is equal to $333 million ($40 million/0.12).

[43] In equation (3), with ΔVC equal to zero, the proportional change in earnings simplifies to the ratio of the change in revenues to earnings ($\Delta R/E$). In the illustration, the ratio R/E equals 10, which, based on an examination of rate-case filed income statements for several gas utilities, seems to correspond to real-world conditions.

[44] RD is arguably more justified, as a true-up mechanism, than purchased gas adjustment (PGAs) clauses since a utility has some control over gas-supply costs because of the ability of most utilities to choose among different supply and transportation sources, and commercial arrangements. PGAs work similarly to RD by protecting the utility from financial losses when purchase gas costs exceed base levels.

[45] In most applications of RD, "baseline" sales account for new customers, with revenue adjustments set on a per customer basis.

[46] In practice, the concept of a fair or authorized rate of return reflects a "zone of reasonableness" within which there is a high probability that the fair rate of return lies.

[47] In most states, purchased gas cost includes interstate pipeline costs.

[48] Depending on how the RD mechanism is structured, actual sales may represent either total sales or per customer sales averaged across (say) the residential class.

[49] See North Carolina Utilities Commission, *Order Approving Partial Rate Increase and Requiring Conservation Initiative*, Docket Nos. G-9, Sub 499, G-21, Sub 461 and G-44, Sub 15, Nov. 3, 2005, 24.

[50] A reduced cost of capital, which might result from revenue decoupling, could offset the higher average cost.

[51] "Customer-initiated" refers to customers consuming less natural gas because of higher prices or other factors that are largely market or economy driven.

[52] In 2005, for example, the city gate price of natural gas in the United States averaged $8.64 per Mcf and the residential price of gas averaged $12.82 per Mcf. (i.e., the city gate price was about 67 percent of the residential price). See Energy Information Administration, *Monthly Energy Review*, March 2006, Table 9.11.

[53] The 2-percent increase approximates a decline in net revenues of the same proportion (assuming minimal variable distribution costs). If one takes the historical decline in average gas use per household of one percent, and adjusting for revenue increases from new customers (which occurs under most existing and proposed RD mechanisms), the 2-percent example would seem to be much higher than expected in a real-world situation.

[54] If the delivered price is (say) one dollar per therm and the customer buys a high-efficiency furnace that saves annually 50 therms of gas usage, the customer can expect her gas bill to decline by $50. If all customers conserve by the same amount, a RD mechanism would result in the base rate increasing (say) by 2 percent and the delivered price by 0.6 percent, the benefits to the customer from this conservation action would decline by only 30 cents.

[55] RD could induce additional customer-initiated energy efficiency to the extent that the utility more aggressively and effectively educate customers on the benefits of energy efficiency.

[56] Energy Information Administration, *Short-Term Energy Outlook*, March 7, 2006, Table A4.

[57] In other words, RD represents a second-best "solution" for poor rate design that includes fixed cost in the volumetric charge. Some proponents of RD view the mechanism as a form of rate design that separates the recovery of fixed costs from volumetric sales, which is exactly what a straight fixed-variable rate design does.

[58] Joseph Eto et al. discussed how risks to consumers would be affected by revenue decoupling. (See Eto et al., *The Theory and Practice of Decoupling*, Report LBL-34555, Berkeley, CA, January 1994.)

[59] In Maine, lower sales levels in the early 1990s caused by an economic recession (in the previous rate case, the sales forecast was substantially too high) led to substantial revenue deferrals that Central Maine Power was ultimately entitled to recover under its revenue decoupling mechanism ("Electric Revenue Adjustment Mechanism"). The utility did not recover these deferrals, however, because of an agreement with parties to avoid immediate rate increases during bad economic times. By the end of 1992, the revenue deferrals had reached $52 million. Observers argued that only a small portion of this amount was the result of the utility's conservation efforts and that the vast majority of deferral, instead, resulted from the economic recession. There was the general perception that the revenue decoupling mechanism shielded the utility against the financial consequences of the recession, rather than providing the intended conservation incentive impact. Termination of the RD mechanism occurred in November 1993. (See, for example, Maine Public Utilities Commission, *Report on Utility Incentives Mechanisms for the Promotion of Energy Efficiency and System Reliability*, presented to the State Legislature, Feb. 1, 2004.)

[60] In testimony before the Wisconsin Public Service Commission, involving Wisconsin Power and Light in Docket No. 6680-UR-114, Ralph Cavanagh argued that since many energy efficiency measures last ten years or more, single year impacts would multiply at least tenfold when assessing shareholder interests. He illustrated this with an example: if total fixed costs are $80 million, with 90 percent recovered in volumetric charge (or $72 million), a one percent decline in consumption means that $0.72 million is lost to shareholders during the first year; over five years, the accumulated loss to the utility would be $10.8 million ($\$0.72 + \$0.72^2 + \$0.72^3 + \$0.72^4 + \$0.72^5$).

[61] This could occur to the extent a decline in gas use per customer helps to trigger a rate filing. A primary rationale for purchased gas adjustment clauses was that they would reduce the need for a utility to file rate cases continuously.

[62] As noted above, reduced gas bill volatility would occur if abnormal weather causes the revenue adjustments.

[63] Test year sales affect the required rate change to recover revenue requirements, with a pessimistic projection justifying a higher rate and an optimistic projection a lower rate. Under a RD mechanism, any bias in the projections will be trued-up over time.

[64] A LRA confines itself to sales/revenues losses from a utility's energy efficiency initiatives. In contrast, a decoupling mechanism covers all changes in a utility's sales.

[65] As expressed by one analyst, methods for verifying savings resulting from energy efficiency programs are likely to be "complex, tedious, and expensive." Another criticism of LRA is that, because of its narrowed focus, the utility would still have an incentive to increased sales through its other activities.

[66] Society may benefit from lower environmental costs associated with the reduced production, transportation, and consumption of natural gas.

[67] The argument here is that since previously a commission ruled that these fixed costs were prudent, the utility has the legal right to recover them fully.

[68] The utility would still have an incentive to maximize its earnings, but under RD it would have different incentives and constraints. Specifically, since presumably increasing sales between rate cases will have no effect on earnings, the utility would instead focus on reducing costs. If a utility allows its costs to rise above test-year costs, it would jeopardize its ability to earn its authorized rate of return, irrespective of the adoption of a RD mechanism.

[69] This argument centers on the common perception that commission endorsement of true-up mechanisms or "trackers" requires the existence of unusual circumstances because of the risk shifting to consumers and, in the case of cost true-ups such as purchased gas adjustment clauses, the weakened incentive of a utility to manage costs.

[70] In Arizona, for example, the Residential Utility Consumer Office (RUCO) argued (in Arizona Corporation Commission Docket No. G-01551A-04-0876) that in acknowledging the disincentive under standard ratemaking for a utility to promote energy efficiency, the commission or a third party could be responsible for administering energy efficiency programs funded by the utility.

[71] Commissioner Lorinzo Joyner's dissent in the Piedmont Gas case in North Carolina echoes this view: "The issue is whether there is a justification for tracking and making rate adjustments based in changes in consumption without consideration of other factors affecting overall expenses and revenues. I agree with the Attorney General that maintaining margin recovery is not sufficient justification in itself and is not consistent with fundamental ratemaking principles which disfavor rate adjustments based on one element of rates 'without appropriate regulatory oversight of the Company's overall expenses, sales volumes, and revenues."' (See North Carolina Utilities Commission, *Order Approving Partial Rate Increase and Requiring Conservation Initiative*, Docket Nos. G-9, Sub 499, G-21, Sub 461 and G-44, Sub 15, Nov. 3, 2005.)

[72] This argument stems from the presumption that RD would remove the financial consequences for a utility from losing sales because of poor quality of service. For firms in most other industries, revenues are highly correlated with the quality of service offered to customers. Under RD, as the argument goes, the benefits to a utility from achieving a high quality of service would decline, if not eliminated.

[73] Industrial customers in particular have raised this point. Other parties have questioned the role of utilities in promoting energy efficiency in light of market forces and the potential role for third parties to implement energy efficiency programs more effectively than the utility.

[74] The logic is as follows: customers as a group would benefit less from conservation with RD as their rates would increase with utility-wide conservation, since some of the savings would flow to the utility to offset the reduction in distribution revenue collected thought energy sales. Consequently, customers would receive less of the savings than they would without decoupling.

[75] The reason given is simply that RD could remove the incentive of a utility to expand its sales by attracting new customers with a promotional rate or other innovative rate design, since any revenue gains may flow back to consumers in the form of lower base rates.

[76] Specifically, the subsection "Expected Outcomes from Revenue Decoupling" addressed them.

[77] One industrial advocate has argued that RD makes a utility indifferent to its sales volume, thus reducing its motivation to accommodate customer needs. He also posed the fundamental problem of a utility simultaneously selling its core service and promoting energy efficiency as conflicting, in his opinion requiring the state commission to set up additional oversight to monitor and regulate these conflicting activities. (See Maurice Brubaker, presentation before the Harvard Electricity Policy Group, March 3, 2005.)

[78] The eight criteria for a desirable rate design are: (1) simplicity, understandability, public acceptability and feasibility of implementation, (2) uncontroversial as to proper interpretation, (3) effectiveness in providing the utility with adequate revenues to recover costs, (4) year-to-year revenue stability, (5) rate stability, (6) fairness among customer classes, (7) avoidance of undue price discrimination, and (8) economically efficient in giving customers proper price signals, for example, in not over-consuming a utility's service. These criteria can be conflicting, with no rules of ranking offered. It is often difficult, if not impossible, to satisfy all of these criteria (for example, public acceptability and efficient pricing); almost all real-world ratemaking outcomes reflect compromises between the different regulatory objectives. Bonbright also identified the four primary functions of public utility rates as capital attraction, efficiency, demand rationing, and income distribution. (See James C. Bonbright et al., *Principles of Public Utility Rates*, 2nd Edition, Public Utilities Reports, Inc., 1988; the first edition, authored solely by Bonbright, was published in 1961.)

[79] Obversely, RD would also reduce the opportunity of a utility to over-earn, which may explain why some gas utilities do not support RD.

[80] As discussed above, however, the monthly or yearly rate adjustments subject to RD would likely be small relative to the total delivered price of natural gas and to other factors affecting price (such as fluctuations in purchased gas costs).

[81] In Oregon, the upgrading of Northwest Natural's Standard & Poor bond rating occurred shortly after the commission approval of a RD mechanism.

[82] See Calvin Timmerman, "Monthly Rate or Revenue Adjustments: Regulatory Perspective," presentation at the Platts Rate Case and Pricing Symposium, Oct. 25, 2004, and Calvin Timmerman, "LDC/EDC Revenue Decoupling," presentation to the 2006 MACRUC Commissioner Only Strategic Planning Session, April 3, 2006.

[83] In its investigation of revenue decoupling, the Connecticut Department of Public Utility Control criticized the Northwest Natural mechanism for being administratively burdensome and not linked to the energy conservation programs funded by the utility.

[84] See Christensen Associates, *A Review of Distribution Margin Normalization as Approved by the Oregon Public Utility Commission for Northwest Natural*, March 31, 2005.

[85] For example, higher customer charges could (1) lead to customer complaints about "minimum" bills during the low-use months, and (2) disproportionately impact low income/low usage customers. A straight fixed-variable rate design for gas distribution service is rare in the United States, with Xcel in North Dakota and Atlanta Gas Light as the only gas utilities currently having this rate design. In the case of Xcel, the company originally proposed a partial decoupling rider but was withdrawn as the parties to a settlement agreement concurred in shifting the fixed distribution costs to a monthly basic service charge. For residential customers, the basic service charge increased from $5.50 to $15.68, or by 185 percent. The expectation is for the new rate design to increase summer gas bills for residential customers and reduce their winter bills. (See North Dakota Public Service Commission, Northern States Power Company Natural Gas Rate Increase Application, *Order Adopting Settlement*, Case No. PU-04-578, June 1, 2005.)

[86] The majority, however, argued that the RD proposal does not violate state statute against retroactive ratemaking since it represents an approved formula as part of a utility's rate structure used to true-up an estimated rate. (See North Carolina Utilities Commission, *Order Approving Partial Rate Increase and Requiring Conservation Initiative*, Docket Nos. G-9, Sub 499, G-21, Sub 461 and G-44, Sub 15, Nov. 3, 2005, at 21.)

[87] A pilot has the benefit of allowing for refinements of the mechanism periodically and of terminating a mechanism that exhibits undesirable results.

[88] In theory, the premise for utility involvement in energy conservation is the existence of serious market failures. Specifically, (1) incorrect pricing of natural gas and its delivery exists because of regulation or market-power conditions, (2) natural gas prices fail to reflect environmental damages and other external costs, or (3) the presence of specific information-related failures that may adversely affect the consumer demand for energy efficiency. Proponents of utility-funded energy efficiency initiatives argue that some or all of these conditions hold.

[89] As an alternative to RD or in conjunction with RD, as proposed by some analysts, direct (targeted) incentives can be provided to a utility in promoting energy efficiency initiatives, or responsibility for implementing utility-funded energy efficiency initiatives can be turned over to a third party.

[90] In Oregon, Northwest Natural committed to promoting energy conservation and agreed to transfer the management of energy efficiency programs to a third party, Energy Trust. In addition, the utility agreed to collect a public purpose charge on gas bills. In the Piedmont Natural Gas case, the North Carolina Utilities Commission conditioned the approval of the RD proposal on the utility aggressively assisting small customers in conserving on natural gas.

[91] Most state commissions using an historical test year adjust test year revenues and expenses for "known and measurable" changes that will likely occur in the future, post-test year period. Typically, the test year is a 12-month period, with adjustments made to the extent necessary (or permitted) based on evidence reflective of conditions during the period new rates are to be in effect. For example, pro-forma adjustments can take into account changes in: (1) customer additions or losses, (2) per customer usage patterns, and (3) weather conditions or new measurements of weather normalization.

[92] As identified by economists, recovering fixed costs in the volumetric charge can: (1) increase revenue and earnings variability, (2) fail to account for cost differences between or within customer classes, (3) convey improper price signals to customers, and (4) lead to inefficient use of a utility's system. On the other hand, the main goal of regulation is not to promote economic efficiency: regulation originated and developed before the ideas of economic efficiency and the principles of welfare economics; most enabling legislation mandates just, reasonable and fair rates, not efficient rates per se.

In addition, redesigning rates to lower the volumetric charge comes across as anti-conservation since it would lower the marginal price of gas. Taking an example, assume that the volumetric distribution charge is 15 percent of the total volumetric charge (inclusive of purchased gas costs), which corresponds to the actual percentage for many gas utilities. By shifting all the distribution costs to a customer charge, the volumetric charge would decline by 15 percent; this means that the marginal price of gas would also fall by 15 percent. Assuming a short-run price elasticity of demand equal to -0.10, the effect would be to increase gas consumption by 1.5 percent. This is about 50 percent above the average annual decline in gas consumption per residential customer over the past 20-25 years (see the earlier discussion on the AGA study).

[93] Specifically, declining consumption would result in a utility increasing the base rate further above short-run marginal cost, which equals close to zero or is minimal. Besides, the pre-adjusted base rate was already above marginal cost, thereby causing RD to widen the price-marginal cost gap.

[94] By adjusting revenues for only a price elasticity effect, the utility still faces the risks associated with other factors of gas consumption, such as weather and general economic conditions.

[95] While it is true that in the short term the level of sales has minimal effect on non-gas costs, these costs can easily deviate from the costs underlying the current base rates. For example, the utility could improve its productivity or in other ways reduce its costs, prior to the next rate case, below the test-year level.

[96] As an illustration, if the sharing arrangement is 50-50 (with no "dead band") and assuming a decline in sales of one percent attributable to the response of consumers to higher prices, a resulting reduction in the rate of return on equity of a 100 basis points would be split evenly between consumers and utility shareholders. Thus, the utility absorbs a loss of 50 basis points. Earnings-sharing mechanisms, labeled alternatively as "revenue (or return) stabilization mechanisms," are currently in place for a few gas utilities in the United States, including utilities located in Alabama, Louisiana, Mississippi, and South Carolina.

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