REVENUE DECOUPLING UNDER ENERGY EFFICIENCY PROGRAMMING: A STRATEGY FOR REGULATORY & UTILITY RATEMAKING

IP3
A Tetra Tech Company

PUBLIC-PRIVATE PARTNERSHIP
WHITE PAPER SERIES

DAVID P. JANKOFSKY

Abstract

Energy efficiency programs are proliferating for a variety of reasons: consumers wanting to save money, a growing public consensus for reducing the carbon footprint of utilities, mandates by regulatory authorities. However, instructing a utility executive to actively promote energy efficiency means telling him to find ways to sell less of his product. To any business executive, that is contrary to the reason for being in business. Further, in the case of a regulated utility—due to the manner rates are designed—a successful energy efficiency program could have a negative impact on the financial viability of the enterprise.

Revenue Decoupling is one attempt to reconcile the stresses between a growing consensus for energy efficiency and the need to maintain financially viable utilities. As with most new initiatives, there are compelling arguments to adopt or not adopt this method of setting rates.

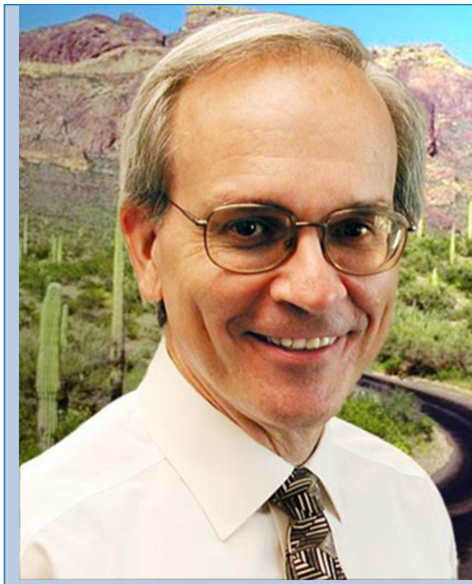
This paper will set forth the definition, rationale, and arguments for and against revenue decoupling. It will also speculate on whether it is reasonable to expect emerging economies to embrace this ratemaking approach.

Definition

The concept of revenue decoupling originated as a ratemaking mechanism designed to eliminate or reduce the dependence of a utility's revenues on sales.

Rationales

The rationale for revenue decoupling begins with the rate design of many utilities. While theory suggests that fixed (demand or customer) charges should cover fixed costs and variable (commodity) charges cover variable costs, utilities are very capital intensive with high fixed costs. That is, the investment required to construct a generating station, for example, is significant before even one kilowatt hour of electricity is produced.



David P. Jankofsky is a regulatory specialist with more than 30 years of experience in regulating utilities and private sector development in the provision of public services. As a Senior Associate and Consultant for IP3, he provides technical assistance and training in the economic aspects of regulation, market structures for utilities, regulatory structures and functions, managing regulatory instruments, and financial regulation techniques and enforcement.

Mr. Jankofsky is a former staff director of the Arizona Corporation (Public Utilities) Commission and former Deputy Director of the Arizona Department of Transportation, where he oversaw a $6 billion transportation budget.

Mr. Jankofsky has worked in Afghanistan, Mexico, Barbados, Jamaica, Tanzania, Kosovo, Panama, Egypt, Indonesia, South Africa, and Albania.

Hence charging (especially) residential customers a fixed amount before they consume even one unit of electricity (gas or water) would result in political difficulties for most regulatory authorities. As a result, there is often an element of fixed cost recovery in the variable (per kilowatt hour in the case of electricity) charge in a customer's bill.

This rate design issue has always at one level been a problem for utilities. However, that problem became more acute as energy efficiency programs began to be mandated by regulatory authorities. At first, these programs were an attempt to delay the addition of expensive new infrastructure that would cause upward pressure on a utility's rates. More recently the growing public desire for all businesses and consumers to reduce their carbon footprints has only increased the pressure on regulatory authorities to mandate them.

However, the incentives provided by historical rate designs and relatively new energy efficiency programs can clash. In the first instance, asking any business executive to sell less of his product is contrary to all of the training and experience that executive has. Secondly, the less electricity that is sold, the less revenue there is available to pay for fixed costs, much of which were debt financed (and built into current rates). Hence, reducing the amount of the electricity sold could actually jeopardize the financial viability of the utility. From this dilemma, various concepts to separate (decouple) sales from revenues emerged, including:

Straight Fixed – Variable Rates that reflect the theory that the fixed costs of providing service are covered by fixed charges and the variable costs by variable charges.

Full Revenue Decoupling in which rates are adjusted to compensate for any deviation between expected and actual sales. An alternative to this approach is to fix the amount expected to be paid by each customer, adjusting the amount periodically to account for overages or shortfalls in the expected amount.

Partial Revenue Decoupling, similar to full revenue decoupling, except that the decoupling is limited to certain factors, such as weather changes that cause a customer to use too much or too little of a product or changes in usage that are only related to an energy efficiency program. (The problem of isolating changes due to one variable alone is obvious.)

Examples of how revenue decoupling mechanisms might work are presented below.

The Mechanics of Revenue Decoupling – Electric Company
Annualized Mechanism[1]
Base Year Assumptions

	Year 1	Year 2
Utility's Operating Costs (A)	$ 4 billion	$ 4 billion
Utility's Rate Base (B)	$ 5 billion	$ 5 billion
Authorized Return on Equity	10%	10%
Authorized Earnings/Profit (C)	$ 500 million	$ 500 million
Utility's Authorized Revenue Requirement (A + C)	$ 4.5 billion	$ 4.5 billion
RD Balance Account (D)	0	$ 45 million
Baseline Sales (E)	45,000 GWh	45,000 GWh
Base Rate/KWh (A + C)/E	$ 0.10	$ 0.10
Effective Rate per KWh (F) = (A + C + D)/E	$ 0.10	$ 0.101

[1] Adapted from ELCON, "Revenue Decoupling: A Policy Brief of the Electricity Consumers Resource Council," January 2007.

Actual Sales Year

Actual Sales (G)	44,550 GWh	45,000 GWh
Actual Revenues Collected (H) = (F * G)	$ 4,455 million	$ 4,545 million
Unadjusted Earnings to Equity Owners (I) = (H – A)	$ 455 million	$ 545 million
Authorized Earnings/Profit (C)	$ 500 million	$ 500 million
Actual Return on Equity (I/B)	9.1%	10.9%
Authorized Return on Equity	10%	10%
End-of-Year Balance Account (D) = (A + C) - H	$ 45 million	0

The tables above show a rate design based simply on taking the allowable revenue requirement (costs plus return) and dividing that amount by the estimated sales of electricity. This yields a rate of $0.10/KWh. When actual sales are less than the projected sales by 450 GWh and revenues are $4.455 billion rather than $4.5 billion, there is a $45 million shortfall. Assuming this shortfall was determined to be due to energy efficiency programs, this $45 million would be recoverable in Year 2 from the rate-payers.

Hence, in Year 2, the $45 million "shortfall" in revenues is added to the amount to be collected from ratepayers. Instead of paying a rate of $0.10/KWh, they pay the slightly higher amount of $0.101. That, if the sales targets are actually met in Year 2, produces the authorized revenues for Year 2 as well as recovers the shortfall in revenues from Year 1.

Another way of structuring a revenue decoupling program is to use a *revenue per customer* mechanism. In this scenario, a set amount per customer is allowed. Customers are still billed on a per KWh basis, but a true up mechanism would be established based on the actual average amount collected per customer.

The Mechanics of Revenue Decoupling – Electric Company
Revenues per Customer Approach[2]
Base Year Allowed Revenue per Customer

Base Year Rate per KWh (A)	$ 0.10
Base Year Sales in KWh (B)	1.0 billion
Base Year Revenue (A * B)	$ 100 million
Base Year Number of Customers (C)	1,000,000
Allowed Revenue per Customer (A * B)/C	$ 100

Calculation of Revenue Adjustment

Base Year Rate per KWh (A)	$ 0.10
Actual Sales (D) – 5% lower than estimated baseline	0.95 billion
Actual Revenues (E) = (A * D)	$ 95 million
Number of Customers (C)	1,000,000
Allowed Revenue per Customer	$ 100
Allowed Revenues (F) = (A) * (B)	$ 100 million
Revenue Adjustment (G) = (F) – (E)	$ 5 million
Forecast Sales Next Year (H)	1.0 billion
Rate Adjustment (G)/(H)	$0.005

2 Also adapted from ELCON.

In this scenario, since the allowable revenues per customer fell short by $5 million ($95 vs. $100 million)—presumably due to an energy efficiency program—an additional $0.005/KWh would be added to Year 2 (or Month 2 in some scenarios) to allow the utility to attain its full revenue requirement.

Arguments in Favor of Revenue Decoupling

1. *It encourages utilities to embrace – or at least not actively oppose – energy efficiency programs.* By seeking to ensure that revenues lost due to these programs are recovered, the financial impact on the company is eliminated and disincentives to fully cooperate are removed.
2. *The variability in rates will be lessened.* Under a rate of return approach to ratemaking, utilities are authorized the opportunity to earn a certain amount of revenues. Should a company fall short of the authorized revenue requirement at the next rate review (assuming the utility has been reasonably well operated) a regulator will increase rates to again allow the utility the chance to earn that revenue requirement. This could cause "rate shock" for customers. A revenue decoupling approach tends to have more frequent and smaller adjustments that would be less disruptive to customers.
3. *The need for laws or regulations to reduce carbon footprints could be mitigated*. A lessened "threat" of action by environmental regulators would, of course, be welcomed by utilities and consumers—as taxpayers—who also should appreciate less government time and effort devoted to unnecessary regulations.
4. *Revenue decoupling leads to a lower cost of capital and therefore lower rates*. The increased stability of revenue flows that results from revenue decoupling leads to better bond ratings for utility debt that in turn lowers the utility's cost of debt. The lower cost of debt results in a lower cost of capital and lower rates than would otherwise be the case.

Arguments Against Revenue Decoupling

1. *Full decoupling takes into account matters driven by weather and other non-conservation oriented items*. If decoupling is supposed to be a method to remove the resistance of utilities to engage in conservation programs, then full revenue decoupling goes well beyond that. By replacing all differences in revenues between what has been authorized by the regulator and what actually occurs, the utility is not just being held harmless for lost revenues due to conservation programs, but also other factors such as changes in weather that should be a part of normal business risk.
2. *Revenue decoupling guarantees actual earnings at the same level of authorized earnings*. This essentially shifts business risk from the utility to the customers. The regulatory compact as it has evolved over time gives utilities the *opportunity* to earn a specific rate of return (assuming that the companies are operated efficiently); full revenue decoupling turns that opportunity into a *guarantee.*
3. *Even partial revenue decoupling, which tries to compensate utilities only for the amounts lost through its promotion of energy efficiency, undermines individual customer efficiency efforts*. That is, if there is a mechanism that raises rates to consumers after consumers have embraced certain energy efficiency initiatives to reduce their energy bills, then the purpose of adopting certain energy efficiency measures is at least partially defeated.

4. *Proponents of revenue decoupling should instead change the rate design.* If certain fixed costs are being covered by the commodity (variable) rate then the rate design should be changed to have fixed charges cover fixed costs and variable charges cover variable costs. This would provide true incentives for customers to adopt energy efficient techniques, for utilities to promote them, and not jeopardize the financial stability of the utility.

A QUICK NOTE ON GAS V. ELECTRIC UTILITIES

Revenue decoupling, by and large, had its genesis in the gas industry. Nonetheless, the principle is equally applicable to both electric companies and water utilities. However the gas industry is facing declining revenues per customer; the electric industry is seeing increasing revenues per customer. As a result, gas utilities face declining revenues between rate cases more so than electric utilities and are therefore a bit more aggressive about their advocacy for decoupling.

Conclusions

Healthy utilities are essential for economic growth and for a good overall quality of life. Something similar could be said for the rates paid by consumers. The dilemma is clear: using a straight fixed variable approach might increase the fixed charges to customers significantly. (Many customers would ask why they are paying a monthly bill even if they do not use the utility service that month.) It was those pressures that caused utilities and regulators to structure rates so that part of the fixed costs is paid in the variable rates. Then, the advent of conservation and energy efficiency programs jeopardizes the utility's financial stability if it cannot adequately cover its fixed costs. Revenue decoupling is a solution, but that in part "rewards" consumers for practicing energy efficiency with higher rates….and bills higher than they would have been.

The implications for emerging economies at the moment are mixed. While being pushed by donors to engage in clean energy programs and use renewable sources of energy, most developing countries cannot even meet their peak demand. Rolling blackouts are common. Surveys have shown that one of the largest impediments to business development in emerging economies is the lack of a reliable energy supply. Hence, governments and utilities are interested in expanding the reach of the energy networks and, at least in the short run, providing more energy to their stakeholders. Perhaps emerging economies would be better served by building out their networks to provide adequate service to their customers and then tackle the issue of how to promote conservation. To be sure, there is nothing inconsistent about pursuing both goals simultaneously, but it is challenging if the utility management and regulator are focused on more than one major issue at a time.