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IPU BIBLIOGRAPHY: DECOUPLING

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Berg, Sanford (1998). *Introduction to the Fundamentals of Incentive Regulation*. Public Utility Research Center, University of Florida. [link]

"All forms of regulation provide incentives. Incentives, information asymmetries, and principal-agent problems all affect company performance. Cost-of-service (rate-of-return) regulation provides an opportunity to cover costs. It also provides companies with an incentive to over/under incest in plant, inflate costs, and cross-subsidize. Regulators generally try to remedy these perverse incentives though regulatory lag, sliding scales, and efficiency audits/reviews. Price cap regulation provides companies with incentives to cut costs. It also dampens the effects of cost information asymmetries between companies and regulators. Service quality and infrastructure development may suffer. Yardstick regulation promotes cost-containment, and dampens the effects of cost information asymmetries between companies and regulators. However, developing appropriate yardsticks is resource intensive. Performance-based regulation utilizes targets to incent the utility. Good performance measures should be accurately observed and verifiable, should reflect the utilities' efforts, and should be structured to reduce the impact of random variation. Franchise regulation represents another approach – where the low-price bidder becomes the supplier. Carefully designed incentive plans can result in benefits to both supplier and consumers."

Boonin, David Magnus (2008). *A Rate Design to Encourage Energy Efficiency and Reduce Revenue Requirements.* National Regulatory Research Institute 08-08 (July). [link]

"The search for low-carbon electricity resources intensifies as more attention is paid to greenhouse gases (GHG). If energy efficiency in the electricity sector is to be a major resource in the battle against greenhouse gases, utility regulators need to create an environment that enables and encourages cost-effective energy efficiency. This paper addresses one overlooked method of decoupling a utility's income from sales and offers a complementary set of price signals to consumers that are designed to enhance energy efficiency. The decoupling strategy is a Straight Fixed Variable (SFV) rate design, and the customer price signal is a Revenue-Neutral Energy Efficiency Feebate (REEF)."

Brennan, Timothy J. (2008). "'Night of the Living Dead' or 'Back to the Future'? Electric Decoupling, Reviving Rate-of-Return Regulation and Energy Efficiency." Washington, DC: Resources for the Future Discussion Paper No. 08-27 (August). [link]

"The distribution grid for delivering electricity to the user has been paid for as part of the charge per kilowatt-hour that covers the cost of the energy itself. Conservation advocates have promoted the adoption of policies that "decouple" electric distribution company revenues or profits from how much electricity goes through the lines. Their motivation is that usage-based pricing leads utilities to encourage use and discourages conservation. Because decoupling divorces profits from conduct, it runs against the dominant finding in regulatory economics

in the last twenty years—that incentive-based regulation outperforms rate-of-return. Even if distribution costs are independent of use, some usage charges can be efficient. Price-cap regulation may distort utility incentives to inform consumers about energy efficiency—getting more performance from less electricity. Utilities will subsidize efficiency investments, but only when prices are too low. Justifying policies to subsidize energy efficiency requires either prices that are too low or consumers who are ignorant."

- Carter, Sheryl (2001). "Breaking the Consumption Habit Ratemaking for Efficient Resource Decisions," *The Electricity Journal* 14: 66-74. [link]

  "Traditional rate design, which ties utilities' financial health directly to the volume of commodity sales, invites an exclusive focus on more traditional distribution and generation capacity expansions -- often in direct conflict with other important societal objectives. This antiquated design must be changed to reward utilities' for making more economically and environmentally efficient resource decisions. Adoption of these ratemaking reforms is critical to the effective integration of promising alternatives such as distributed resources."

- Cavanagh, R. C. (1989). "Global Warming and Least-Cost Energy Planning," *Annual Review of Energy* 14: 343-73. [link]

  "This article contends that US energy policy has been working to increase, rather than forestall, the danger of global warming. In particular, recent trends toward deregulation of the energy sector are grossly insufficient as solutions to the problem, although not necessarily inconsistent with them. The article outlines a way to organize urgent US and international energy policy reforms, drawing on the experience of certain state utility regulators with an approach called 'least-cost energy planning.' Least-cost planning recognizes improvements in the efficiency of energy use as a major source of additional energy supplies, and seeks fair competition for energy investment dollars between conservation measures and production facilities."

- Cavanagh, Ralph (2006). "Rebuttal Testimony of Ralph Cavanagh for Questar Gas," before the Public Service Commission of Utah. Docket No. 05-057-T01 (August). [link]

  "My testimony rebuts challenges in this proceeding to the Company's proposal to institute modest annual rate true-ups, or "decoupling," in order to remove a strong disincentive to Company investments and advocacy in support of energy efficiency improvements,"

- Center for Energy, Economic and Environmental Policy (2005). "Decoupling White Paper #1," Rutgers University (October). [link]

  "There is no single definition of decoupling or method of achieving its goals. In the most narrow sense, decoupling could retain a cost-of-service basis but severe the link the between a utility's revenues and its sales. The utility would recover its prudently incurred costs but the recovery of its fixed costs would be independent of its throughput. In a broader sense, decoupling could include incentives and penalty mechanisms that reward and penalize a utility based on its performance. Not only would the link between throughput and revenues be decoupled, but also the link between costs and revenues would be decoupled."

Costello, Kenneth (2006). "The 'Great Debate' Over Revenue Decoupling," at the 2006 Mid-America Regulatory Conference, Columbus, Ohio (June). [link]

"In regulatory proceedings, groups have presented several arguments on both sides of the RD debate. Applying longstanding ratemaking principles and regulatory objectives, RD scores well in some aspects while not so well in others."

Costello, Kenneth (2006). "Obstacles to Revenue Decoupling for Gas Utilities," at the Workshop on Aligning Regulatory Incentives with Demand-Side Resources, San Francisco (August). [link]

"Important elements needed to get broad acceptance of RD: (1) commitment by a utility to promoting energy efficiency, (2) demonstration of benefits to consumers, or at least no harm to consumers, and (3) consumer/public education."

Costello, Kenneth (2007). "Revenue Decoupling for Natural Gas Utilities," at the Mid-Atlantic Conference of Regulatory Utilities Commissioners, Williamsburg, Virginia (June). [link]

"Cogent arguments, in support of advancing specific regulatory objectives, presented before state commissions on both sides of the RD debate. Some of the arguments, however, are feeble (or even foolish), and state commissions should immediately weed them out."

Dismukes, David E. (2007). "Regulatory Issues for Consumer Advocates in Rate Design, Incentives and Energy Efficiency," for the National Association of State Utility Consumer Advocates (June). [link]

"The commodity share of overall natural gas rate has increased over recent years. Yet despite high prices, and decreases in use per customer, overall DNG revenues per customer are at close to historic highs."

Electricity Consumers Resource Counsel (2007). *Revenue Decoupling.* Washington DC: ECRC (January). [link]

"ELCON members are strong supporters of energy efficiency and are world-class practitioners of innovative technologies that reduce their energy costs to improve their competitiveness. But ELCON strongly opposes decoupling because it disrupts and distorts the utility core business functions and is not a particularly effective way of promoting energy efficiency or anything of benefit to customers. Time and time again decoupling has been tried in several states, only to be suspended because it unduly interferes with the overall regulatory process."

Eto, Joseph, et. al. (1994). *The Theory and Practice of Decoupling.* Berkley, CA: Lawrence Berkley Lab, LBL-34555 (January). [link]

"Decoupling revenues from sales is an important regulatory option under consideration by regulators seeking to transform utilities from sellers of a least-cost energy commodity to providers of least-cost energy services. This report examines decoupling from three perspectives. First, we consider threshold issues for decoupling, including characterization of the ratemaking practices addressed by decoupling which make incremental sales profitable to utilities, the role of rate case frequency in limiting the consequences of this incentive, and finally the existence of other incentives to sell electricity, which are not addressed by decoupling. Second, we examine the operation and performance of decoupling, including the mechanics of decoupling as a between-rate-case

modification to the traditional ratemaking process, the ability of revenue-per-customer decoupling versus traditional ratemaking to recover nonfuel costs accurately, and a comparison of the profit implications of various decoupling approaches. Third, we review the rate impacts of decoupling for California's electric utilities, which have had the longest experience with decoupling."

- Florida Public Service Commission (2008). "Report to the Legislature on Utility Revenue Decoupling" (December). [link]

  "Altogether, stronger mandates for conservation, the administrative complexity of decoupling mechanisms currently implemented in other states, and the FPC revenue decoupling experiment support the position that Florida is already paving a path toward the objectives of decoupling without incurring the cost and difficulties associated with design, implementation and maintenance of a specific decoupling mechanism. This consideration must be weighed with the fact that a significant portion of revenues (including an increasing level of capital costs) are currently being recovered through clauses, achieving a similar effect as would be achieved with a decoupling mechanism. The greater the emphasis placed on achieving mandatory energy efficiency goals, the lesser the impact that would be gained by implementing a decoupling mechanism."

- Graniere, Robert and Andrew Cooley (1994). *Decoupling and Public Utility Regulation*. Columbus, Ohio: The National Regulatory Research Institute 94-14 (August). [link]

  "The purpose of the report is to study the relationship between decoupling and public utilities regulation. Decoupling is a regulatory mechanism whose design promotes demand-side management (DSM) by breaking the linkage that ties the utility's financial position (that is, revenues or profits) in any year to its actual sales in that year. However, a decoupling mechanism has a particularly unique way of breaking these ties. Any mechanism of this type makes the utility whole regardless of the source of the revenue or profit losses. Consequently, the utility is insulated from the financial effects of weather fluctuations, competition, misforecasts of ratepayer growth, unanticipated movements in the business cycle, and DSM."

- Hansen, Daniel G. (2007). *A Review of Natural Gas Decoupling Mechanisms and Alternative Methods for Addressing Utility Disincentives to Promote Conservation.* Madison, WI: Christensen Associates Energy Consulting, LLC (May). [link]

  "A potentially important outcome of traditional ratemaking is that the utility has a disincentive to promote conservation and energy efficiency. Several methods have been proposed to reduce, eliminate, or reverse this incentive problem. Decoupling mechanisms attempt to solve the incentive problem by adjusting rates to allow the utility to recover deviations between actual and allowed revenues, where various adjustments may be made to allow revenues depending upon the specific mechanism. Because the utility recovers its fixed costs regardless of the level of actual sales, the disincentive to promote conservation and energy efficiency is removed."

- Hill, Lawrence (1995). *A Primer on Incentive Regulation for Electric Utilities.* Oak Ridge, TN: Oak Ridge National Laboratory ORNL/CON-422 (October). [link]

  "In contemplating a regulatory approach, the challenge for regulators is to develop a model that provides incentives for utilities to engage in socially desirable behavior. In this primer, we provide guidance on this process by discussing (1) various models of economic regulation, (2) problems implementing these models, and (3) the types of incentives that various models of regulation provide electric utilities. We address five regulatory models in depth. They include cost-of-service regulation in which prudently incurred costs are reflected dollar-

for-dollar in rates and four performance-based models: (1) price-cap regulation, in which ceilings are placed on the average price that a utility can charge its customers; (2) revenue-cap regulation, in which a ceiling is placed on revenues; (3) rate-of-return bandwidth regulation, in which a utility`s rates are adjusted if earnings fall outside a 'band' around equity returns; and (4) targeted incentives, in which a utility is given incentives to improve specific components of its operations. The primary difference between cost-of-service and performance-based approaches is the latter sever the tie between costs and prices. A sixth, 'mixed approach' combines two or more of the five basic ones. In the recent past, a common mixed approach has been to combine targeted incentives with cost-of-service regulation. A common example is utilities that are subject to cost-of-service regulation are given added incentives to increase the efficiency of troubled electric-generating units."

- Hirst, Eric. (1993). *Statistical Recoupling: A New Way to Break the Link Between Electric-Utility Sales and Revenues.* Oak Ridge, TN: Oak Ridge National Laboratory ORNL/CON-372 (September). [link]

  "Statistical recoupling uses statistical models that explain retail electricity sales as functions of the number of utility customers, winter and summer weather, the condition of the local economy, electricity price, and perhaps a few other key variables. These models, along with the actual values of the explanatory variables, are used to estimate 'allowed' electricity sales and revenues in future years. For example, a utility might use quarterly data from 1980 through 1992 to estimate the SR models. The models would then be used to determine allowed revenues for 1993, 1994, and 1995"

- Hirst, Eric, et al. (1994). "Three Ways to Decouple Electric-Utility Revenues from Sales," *Electricity Journal* 7, 38-47. [link]

  "Decoupling first breaks the link between utility revenues and kWh sales. It then recouples revenues to something else, such as growth in the number of customers, the determinants of changes in fixed costs, or the determinants of changes in electricity use. This paper explains and compares three forms of decoupling: revenue-per-customer (RPC) decoupling, RPC decoupling with a factor that allows for changes in elasticity use per customer, and statistical recoupling. We use data from five utilities to see how the three methods perform in terms of electricity-price volatility and ease of implementation. We discuss the strengths and limitations of each approach, emphasizing the tradeoff between simplicity and price stability."

- Kihm, Steve (2008). *A Financial Framework for Analyzing Incentives and Disincentives for Wisconsin Utilities to Promote Energy Efficiency.* Madison, WI: The Energy Center of Wisconsin (September).

  "This paper provides a framework for analysis of the incentive and disincentives for utilities to promote energy efficiency. While we draw conclusions where they are analytically obvious, we make no policy recommendations. As such, the paper provides a structure that may help policy makers in assessing the reasonableness of policy options related to the impact of energy efficiency efforts on utilities. While our framework is broad-based in nature, we focus the analysis on issues specific to Wisconsin. The thrust is to present a basic structure for analysis that can accommodate the Wisconsin experience."

- Kihm, Steven. "When Revenue Decoupling Will Work . . . And When It Won't," *The Electricity Journal* 22(8), 19-28.

  "As long as the Averch–Johnson effect continues to hold –which it likely will for many utilities – it may be difficult to persuade such utilities to abandon large-scale supply-side construction plans in favor of aggressive promotion of energy efficiency, even if a decoupling mechanism is in place."

Kushler, Mark, et al. (2006). *Aligning Utility Interests with Energy Efficiency Objectives: A Review of Recent Efforts at Decoupling and Performance Incentives.* Washington, DC: American Counsel for Energy-Efficient Economy U061 (October). [link]

"This report examines recent experience with two key regulatory approaches to overcome these structural disincentives: (1) 'decoupling' of utility revenues and profits though periodic 'tune-up' of actual to projected sales; and (2) providing shareholder 'performance incentives' for achieving energy efficiency program objectives. These basic concepts are not new. In the 1980s and 1990s during the era of integrated resource planning' a number of states enacted such policies. However, the advent of the utility restructuring movement greatly diminished interest in such policies and regulations; most of them were dropped in the mid- to late 1990s. The growing need for energy efficiency as a resource to help meet utility system needs has renewed interest in these regulatory approaches. Our review of these recent experiences includes case studies of states or individual utilities where either decoupling or shareholder performance incentives have been enacted."

Lazar, Jim (2008). *Decoupling Impacts on the Cost of Capital.* Regulatory Assistance Project for the Minnesota Public Utilities Commission (April). [link]

"The investor receives the same return, more stable earnings, and a lower business risk profile. The consumer receives a lower revenue requirement. If weather decoupling is done in real-time (every billing cycle), the consumer also receives a lower bill in cold years, when bills are most difficult to pay."

Lesh, Pamela, G. (2009). *Rate Impacts and Key Design Elements of Gas and Electric Utility Decoupling.* Graceful Systems LLC (June). [link]

"This report compiles the rate impact experience during this decade with decoupling of retail gas and electric utility revenues from sales volumes and provides, along with this, information on relevant order numbers, statutes, mechanism descriptions, and implementing tariffs. Sources included utility and state regulatory commission websites, the American Gas Association and the Edison Electric Institute, and, in a few cases, helpful utilities. Immediately below is a brief explanation of 'decoupling' as used in this report, followed by a summary of the findings and a short description of methodology. The report concludes with observations about utility ratemaking."

Maine Public Utilities Commission (2004). "Report on Utility Incentives Mechanisms for the Promotion of Energy Efficiency and System Reliability," Report to the State Utilities and Energy Committee (February). [link]

"In broad outline, the Commission has concluded that the incentives utilities currently have under rate cap regulation to increase sales, although magnified to some degree, are similar in kind to the incentives they had under more traditional regulation. Moreover, it does not appear that utilities currently acting on these incentives have a significant opportunity to blunt the effectiveness of current efficiency and conservation programs in Maine, especially now that those programs have been removed from utility control. Finally, while there are a number of tools available to the Legislature and the Commission that could to some degree lessen the remaining utility incentives to frustrate conservation efforts, these tools are likely to have ancillary consequences that could, in the Commission's view, create substantial adverse effects."

- McCarthy, Kevin E. (2009). "Electric Rate Decoupling in Other States," Connecticut General Assembly Office of Legislative Research Report (January). [link]

  "Under current rate-making practices in most states, the vast majority of a utility company's revenues are tied to its sales. Advocates of decoupling argue that this creates a financial disincentive for companies to promote conservation programs and may increase rates by increasing uncertainty that the company will recover its allowed costs. On the other hand, people who are skeptical of decoupling believe that (1) the companies have been effective in promoting conservation without using this approach, (2) decreases in sales can be the result of factors unrelated to conservation, and (3) decoupling is inconsistent with established utility rate-making principles."

- Meehan, Eugene T. and Wayne P. Olson (2006). *Distributed Resources: Incentives.* NERA Economic Consulting (April). [link]

  "The primary focus of this white paper is to set forth for consideration several workable models for financial incentives that would encourage utilities to play an appropriate role in efficient DR deployment and operation. These proposals are necessarily tentative in nature. The very nature of DR makes it very difficult to craft robust DR incentive schemes that can work well in a variety of circumstances. The great variety of historical and regulatory environments may result in irreducible differences between utilities and across jurisdictions by dramatically changing the cost/benefit analysis for each type of DR program. Care must be taken in ensuring that the unique circumstances in a particular jurisdiction are recognized. This paper specifically addresses DR in a restructured environment, since implementing DR in the new electricity markets poses a novel and important challenge."

- Moskovitz, David, et. al. (1992). *Decoupling vs. Lost Revenues: Regulatory Considerations.* Gardiner, ME: Regulatory Assistance Project (May). [link]

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

- National Association of Regulatory Utility Commissioners (2007). *Decoupling for Electric and Gas Utilities: FAQ*. Washington, DC: NARUC Grants and Research Department (September). [link]

  "State Public Utility Commissions around the country are expressing increasing interest in energy efficiency as an energy resource. However, traditional regulation may lead to unintended disincentives for the utility promotion of end-use efficiency because revenues are directly tied to the throughput of electricity and gas sold. To counter this "throughput disincentive," a number of States are considering alternative approaches intended to align their utilities' financial interests with the delivery of cost-effective energy efficiency programs. "Decoupling" is a term more are hearing as a mechanism that may remove throughput disincentives for utilities to promote energy efficiency without adversely affecting their revenues."

Perkins, John R. (2007). "Policy Options for Energy Efficiency Programs: Decoupling, Incentives and Third-Party Administrators," at NARUC Summer Meeting, New York (July). [link]

"Tension between energy efficiency and natural gas utilities' opportunity to earn authorized rate of return 'does not appear to be a substantial problem in Iowa.' The data does not show a direct correlation between IOU net operating income and declining customer usage as a result of energy efficiency programs"

Reddy, Amulya K.N. (1991). "Barriers to Improvements in Energy Technology," *Energy Policy* 19, 953-961. [link]

"[T]he paper discusses the typology of barriers, explores their origin and suggests measures that, by themselves or in combination with other measures, will overcome these barriers. Since most of the barriers dealt with can be found in the 'barriers' literature, any originality in the paper lies in the systematic organization, synoptic view and holistic treatment. Of course, the scheme can be expanded and improved. In that sense, this paper is intended to initiate a comprehensive treatment of barriers, their origins and the measures that contribute to overcoming them. Hopefully, such a treatment will facilitate the implementation of energy-efficiency improvements involving a wide diversity of ever-changing energy end-uses and consumer preferences."

Sedano, Richard (2009). "Decoupling Utility Sales from Revenues," for the Kentucky Public Service Commission (April). [link]

"Ratemaking policy should align utilities' profit motives with public policy goals: acquiring all cost-effective resources, whether supply or demand."

Solar Electric Power Association (2009). *Decoupling Utility Profits from Sales.* Washington, DC: SEPA Report No. 03-09 (February). [link]

"This decoupling white paper stays neutral on the topic, instead providing an overview of the problem with revenue loss and a background on net metering and its specific impact on the problem. The paper then goes on to more specifically define and discuss decoupling and alternatives to decoupling. This is followed by a decoupling case study of a hypothetical utility, which shows the relative magnitude of decoupling overall and estimations of the impact of photovoltaics from a renewable portfolio standard that includes a solar specific requirement."

Sotkiewicz, Paul, M. (2007). "Advantages and Drawbacks of Revenue Decoupling: Rate Design and Regulatory Implementation Does Matter," Florida Public Service Commission's Workshop on Energy Efficiency Initiatives (November). [link]

"Balance the risk and reward between utilities and customers…this will depend upon perceptions of risk and reward in the two implementations. Stable customer rates and bills…two-part tariff (SFV) accomplishes this. Stable utility revenues…in theory either implementation can accomplish this, but hearings under volumetric rate implementation introduces risk… bills…two-part tariff (SFV) would do better. Administrative simplicity and managing regulatory costs…two-part (SFV) would do better by eliminating the need for true-up hearings."

🗋 Sotkiewicz, Paul M. (2007). "Determining Winners and Losers from Revenue Decoupling: Rate Design and Regulatory Implementation Does Matter," Florida Energy Commission's Advisory Group on Energy Efficiency and Conservation, Orlando (July). [link]

"Consumers and utilities can both win under a two-part tariff implementation with the right regulatory mechanisms and implementation. But this takes more thought, time, effort, and thinking outside the 'traditional regulatory box.'"

Additional Decoupling Reference Links

- Center for Energy, Economic and Environmental Policy. "Decoupling Resources." [link]
- Massachusetts Technology Collaborative. "Decoupling of Utility Rates." [link]
- The Rhode Island Public Utility Commission. "DOCKET NO. 3943." [link]