BOOK REVIEWS

The Market and the Economics of Large Oil Tankers by OLIVIER GOLOMER. (Oxford, UK: Oxford Institute for Energy Studies, 1996), 159 pages. ISBN 0-948061-94-4.

Imagine yourself in control of a fleet of VLCCs (Very Large Crude Carriers of 250,000 deadweight tons or more) and eager to join a P&I Club (Protection and Indemnity insurance), or to know whether your vessels are following the MARPOL rules (Prevention of Pollution from Ships), or to understand why your Dirty Tankers can charge only about one-third as much as Clean Tankers for an assignment from the Arab Gulf to the Far East. For those unlucky enough to find themselves in this position, Golomer's book is required reading.

Its weakness is that anyone in the tanker market and enjoying any kind of responsibility for real ships must already know the jargon of what used to be London's Baltic Exchange. For anyone outside the business, Golomer (who works for the French major Elf) is far too close to his subject, so that he blurs the romance—and dangers—of the enormous burden of transporting oil by sea.

Some of Golomer's most striking comments are tucked in as throw-away phrases and have to be hunted for among the mass of detail. He makes little of the $5 billion already spent on the 1989 Exxon Valdez grounding. There is no hint that (as happened early this year) the collision of a single, small products tanker in the English Channel could spread air pollution across the whole width of England. There is no systematic review of the frequency and cost of tanker accidents. But there is the reassuring reference to the tanker industry as being "generally quite safe."

By contrast, enough information is given on the ever-present "rust buckets" within the fleets to leave the reader with a sense of disasters waiting to happen. An ageing VLCC controlled by a reputable operator can be kept on the high seas for an average of $14,000 per day. For an "unscrupulous cost-cutting operator," this average can be shaved to $6,000. How can reputable operators (presumably including the major oil companies) hope to compete in the free-for-all of today's tanker business?

Golomer estimates that 50 percent of the world's VLCC tonnage barely meets generally accepted standards of safe operation, and that 10 percent is managed "with poor quality standards." This means that protection of coast lines is left to controllers in ports where the sub-standard tankers call. But Golomer

refers to "rumours" that such controllers "do not have the proficiency necessary to assess either ship condition or crew qualifications or operational procedures."

Critical to questions of quality is the problem of crew training. Golomer lays bare the flags-of-convenience anomaly, which has resulted in 37 percent of the world's VLCC fleet having been registered in Liberia or Panama. Crew costs have thus been cut to as little as one-twelfth of those borne in Europe or North America. The paper recognizes that such savings may carry countervailing costs "particularly on repairs and on the probability of an incident." The author gives no hint that these "incidents" can include last year's Sea Empress grounding, in which Milford Haven in Wales was coated with crude oil from a supertanker whose Russian captain and Welsh pilot were apparently unable to pass orders to a polyglot crew.

The tax implications of this shift in registration are seriously over-simplified by Golomer. Zero-rated income tax and capital gains tax in the country of registration by no means describes, as the paper suggests, the reality of tanker ownership. More than 30 million barrels daily are tanker-borne to consumers (in a total world consumption of some 75 million barrels daily). Tax authorities in the consuming countries have made sure that tax is paid lower down the energy stream—not left unpaid.

The same system applies, though with gaping holes in it, to environmental charges. Current insurance charges for the environmental hazards of a supertanker are quoted at around $1,000 per day for worldwide trading. But 70 percent of the fleet is at least 15 years old, and only the Japanese make a point of scrapping their vessels when they reach their 20th birthday. Older tankers should (but do they?) pay much higher premiums.

A recurring theme of Golomer's book is that standards imposed in the United States by the Oil Pollution Act of 1990 could be extended to the European Union and other centers of the oil trade. Imports of crude oil into the United States normally arrive by supertanker, and can only be received in the relatively safe conditions of the Louisiana Offshore Oil Port (LOOP to the trade). They are also restricted by the need to obtain a highly demanding Certificate of Financial Responsibility. This in effect imposes unlimited liability for misconduct, and very expensive compensation rates for tankers in US waters.

Golomer foresees the possibility of such restrictions being adopted in other parts of the world. Meanwhile, shady operators with below-standard ships can remain busy—and profitable—so long as they steer clear of United States waters.

The London-based International Maritime Organization (IMO to fellow member of the United Nations family) is, of course, fully aware of the dangers of hugely increased sea traffic in a largely uncontrolled market. Golomer refers to the weakness of the IMO machinery, resulting in delays of up to 10 years in

introducing safeguards to prevent the repetition of every accident that occurs. He also allows the reader to infer that the Organization possesses virtually no executive or police powers. But he does not delve into the Byzantine arrangements under which Panama and Liberia together hold almost one-quarter of the voting power, while the US and the UK together hold only 7 percent of IMO votes.

This new study of a disturbing and important subject should be supplemented by more current reading of the trade press, such as the weekly *Petroleum Argus* and the monthly *IMO NEWS*. It certainly merits the addition of a glossary and index.

Edward Symonds
Energy Economics & Finance
Dorchester DT2 ODJ England

* * * *

Transmission Pricing and Stranded Costs in the Electric Power Industry by WILLIAM J. BAUMOL AND J. GREGORY SIDAK. (Washington, D.C.: The AEI Press, publisher for the American Enterprise Institute, 1995), 180 pages, includes bibliographical reference and index, ISBN: 0844739235.

Although treating the economics of U.S. electric regulation, the book is useful to all who are interested in regulation and the interrelated subjects of a program for deregulating electric utilities. Most of the issues addressed in the United States on transmission access and pricing are relevant to other countries, including developing countries, that decide to de-integrate their electricity industries and to introduce competition in the generating segment.

Transmission will continue to have characteristics of a natural monopoly even in unbundled structures but especially because it links the potentially competitive segment (generation) with the natural monopoly sector of local distribution. Thus, rules and pricing for access to transmission are critical to developing an efficient restructured framework with multiple producers wanting to sell their products to multiple buyers via a regulated natural monopoly transmission network. The transmission utility detached from the generating sector and required to provide access to multiple sellers could find itself with "stranded costs" or financial commitments that need to be recovered in pricing transmission. As an example, "retail wheeling" and "stranded cost" issues are currently being addressed in the process of restructuring the power sector in the Philippines.

The book has 11 chapters. Following the introductory chapter are seven chapters that provide a very readable review and reference for both those familiar with the subject and those seeking a good introduction to regulatory economics. These chapters discuss: (1) the developments that may call for partial deregulation, enhanced flexibility in regulation, or both; (2) the appropriate criteria for judging whether and to what extent it is desirable to free portions of the electric power industry entirely, or to increase the flexibility of their regulation; (3) rules constraining the decisions of electric utilities in their production of services that continue to be regulated; (4) the harm to consumers from price regulations based on historical, "fully allocated" costs; (5) rules governing the pricing of final products; (6) rules on the recovery, through product prices, of sunk costs incurred before the advent of competition in the market segment at issue; (7) rules on pricing of inputs sold to competitors, such as the transmission of bulk power generated by another firm; and (8) the practical role of Ramsey pricing in the regulation of electric utilities.

Two of several major conclusions of the book are of universal interest, given the world-wide current debate on transmission pricing and the potential for "stranded" or "orphaned" costs. These issues arise in efforts to deregulate the industry and introduce competition (through independent private power producers, IPPs) in the generating sector. Both conclusions emphasize the role of opportunity costs in determining product pricing. These are:

> ...if transmission facilities are to continue to be owned by the electric utilities and used to provide transmission service both to themselves and to their competitors, then the pricing of transmissions service clearly becomes important for the preservation of effective competition in generation. Economic efficiency requires that this service be priced in accord with what has been called the efficient component-pricing rule. This rule requires the utility proprietor of the transmission facility to charge itself for their use exactly the same price that it charges its competitors.... [p. 5]

> ...there are both efficiency and equity reasons supporting pricing arrangements that enable regulated utilities to recover costs stranded during the transition to a competitive regime in generation of electricity ... [through] inclusion of a suitable contribution for the purpose in the utility's transmission charge. Such a way of dealing with the problem is competitively neutral and consistent with the requirements of economic efficiency if the transmission is set in accord with the efficient component-pricing rule. [pp. 5-6]

Baumol and Sidak argue that two characteristics of the efficient component rule apply to power transmission. In the efficient component model, access is an intermediate good, an input used to produce a final product–delivered bulk power, and the input is produced by the utility providing transmission. The issue in the case of the utility versus IPPs is the same. The utility and IPPs are horizontal competitors in the market for delivered bulk power (the final product). The utility provides "interconnection" (an intermediate input) to the IPP, i.e., to its competitor's production function. The issue rests on opportunity cost as a basis for pricing.

The "stranded cost" issue is a case in which the "efficient component rule" could be usefully applied. It involves transmission access provided by an incumbent utility to IPPs and how to price this access, i.e., how to determine "wire access charges" when mandatory wheeling is imposed on the utility. Mandatory wheeling imposes costs on the wheeling utility that must be recovered in pricing. It involves efficiency and equity issues which the regulatory framework for transmission would need to address.

Baumol and Sidak highlight the critical issue: i.e., efficiency in the choice of a supplier. That is, is the supplier chosen by the buyer the most efficient, least-cost supplier? Or is the "lower cost supplier" able to charge less for its output because it is not paying the full social opportunity cost of its operation? The issue then is one of allocative inefficiency. It involves long-run increased costs to consumers because it involves inefficient use of resources, thus constituting a loss to society. Kahn and Taylor (1994) caution, nonetheless, that–in a dynamic context–the costs to society of inefficient duplication of facilities (that arise from the higher real costs of making it possible for the market to be served by two or more competitors rather than by one firm) may be a small price to pay for the dynamic benefits of the competition it makes possible (Kahn and Taylor 1994, p. 238).

The long-term implications of stranded costs extend beyond the firm's revenue losses. Baumol and Sidak (pp. 101-108) argue that investment in a regulated utility differs from investment in a competitive firm. Unlike a competitive firm, a regulated utility has ceilings on earnings. In return, an implicit regulatory compact holds that the utility would provide a socially useful service. If it fulfils its obligation, a failure to allow recovery of stranded costs because of a change in the regulatory framework violates that compact. This could cause investors to avoid investments in regulated utilities. The long-term issue is one of the investment risks similar to those faced by competitive international firms in unfamiliar host-country environments. Multinational companies will not invest in countries where they face high risks of midstream changes in the "rules of the game" governing the recovery and repatriation of profits. Risks are allocated differently in competitive and regulated environments. In the case of multinational companies, they had to account for what is now referred to as "political risks" as opposed to commercial risks

normal to all commercial ventures in competitive settings [Siddayao, 1978, 1980, and Konoplyanik, 1993]. Regulated utilities do not normally expect to account for "regulatory risks."

The case for stranded costs recovery stems from the disparity in obligations between the utility and its competitors. This undermines the competitive market's ability to enforce efficiency in the industry. Rather than a competitor facing barriers to entry, the utility faces what is referred to as "incumbent burdens" arising from its having made investments, contracted obligations, and supplied a product under a specific regulatory framework. Baumol and Sidak (pp. 102, 157-158) argue that it would thus be inequitable and inefficient to ignore the issue and to penalize a utility for actions it was required to take. The authors conclude that regulators and courts dealing with stranded costs issues would generally be obligated to promote the interests of consumers in adequate and reliable service at a reasonable cost, but at the same time giving due regard for the legitimate concerns of investors. They suggest that the key policy issue is to arrange for the recovery of stranded costs in a manner that is "competitively neutral." The policy must allow the entry of efficient competitors within a framework of symmetrical obligations, i.e., each actor must compete evenly on the basis of relative efficiencies. If the policy allows for a competitively neutral framework, the price charged would reflect the true social opportunity cost of transmission. Application of the efficient component enhances the possibility of creating this framework.

The efficient component pricing proposed by Baumol and Sidak is a generalized approach to addressing transmission access and pricing issues in a regulated industry. It can be applied in any country that needs to address transmission access and pricing or "stranded costs." The rule can be applied within a region or country and among regions and countries. The approach is amenable to variations and innovations, so long as the basic criteria of covering opportunity costs–either through effective regulation or effective competition–are kept in mind. Baumol and Sidak's adaptation of the rule to pricing power transmission issues in the United States' electricity industry is an important contribution to a practical approach to pricing transmission on a universal level.

Corazon Morales Siddayao
UPecon Institute of Resource Studies
Arlington, VA, USA

References:

Kahn, Alfred E. and W. E. Taylor (1994). "The pricing of inputs sold to competitors: A comment." *Yale Journal on Regulation* 11(186): 225-240.

Konoplyanik, A. (1993). "Russia struggling to revive production, rebuild oil industry," *Oil and Gas Journal* 91(31) (Aug. 2): 43-51.

Siddayao, C. M. (1978). Round Table Discussion on ASEAN and the Multinational Corporations. Singapore: Institute of Southeast Asian Studies.

Siddayao, C. M. (1980). *The Supply of Petroleum Reserves in Southeast Asia: Economic Implications of Evolving Property Rights Arrangements*. Kuala Lumpur (Malaysia): Oxford University Press.

* * * *

A Shock to the System: Restructuring America's Electricity Industry by TIMOTHY J. BRENNAN, KAREN PALMER, RAYMOND KNOPP, ALAN KRUPNICK, VITO STAGLIANO, AND DALLAS BURTRAW. (Washington: Resources for the Future, 1996), 160 pages. ISBN: 0-915707-80-2.

In the preface to this book, the half-dozen authors cite Pascal's apology for not taking time to write a short letter. True to this reference, the book is brief–a mere twenty-two pages of large print per author. The book achieves its committee's goal of presenting a balanced introduction to the electricity industry restructuring debate, which is certainly no easy undertaking. Where this book falls short is probably irrelevant for its intended audience, which includes the public at large and policymakers who will be part of restructuring but are not yet up to speed on this complex and arcane topic.

Resources for the Future (RFF) has the laudable mission of creating and disseminating knowledge that helps people make better decisions about the conservation and use of natural resources and the environment. Given its mission, RFF rightly selects economics as its primary analytical tool, in which this book is solidly grounded. The rest of this review is divided into two parts. The first section is for those readers who wish to understand the basic questions of this debate along with the major issues and are wondering if this book is worth reading. The remainder of the review is for those of us who are active participants in this debate and cannot resist reading what others have to say and commenting on it.

For the novices, this book is worth reading to grasp quickly the key issues and flavor of restructuring. Unfortunately, it has very few references and no bibliography. The authors pride themselves on bending over backwards to be fair to all sides of the debate and presenting their analysis in such a way that all parties will have disagreements with what they wrote. What is interesting about this approach is that it is also the strategy of some major utilities. For example, New England Electric System (NEES) prides itself on accommodating all stakeholders and as a consequence has adopted the strategy of exiting a major part of its business. This exit is not driven by the desire to cut future losses, which would be the case for firms in other industries, but rather to minimize its past losses by maximizing its chance of recovering its capital invested under the

old regulatory regime. This may seem paradoxical or even perverse, but it typifies the core issues of stranded cost, market power, and retail access all of which are explained clearly by the authors.

The authors also present different models of competition. These basic questions revolve around the extent to which electricity markets should be centralized and whether competition should include the ability of retail customers to select their electricity provider. Consistent with their economic framework, the authors also discuss the pros and cons of vertical integration in a balance fashion. As one would expect, the authors include a chapter on "Implications of Restructuring for Environmental Protection," which, in the spirit of the book, frames the issues and policy choices as opposed to taking a specific position.

For the readers who live for the back-and-forth of the restructuring debate, this book provides a convenient vehicle for continuing our discussions. It also represents, at least in my mind, what is wrong with the debate. The Federal Energy Regulatory Commission (FERC) has defined restructuring in terms of market power instead of economic efficiency and its counter-part, regulatory inefficiency. At first glance such a distinction may seem overly academic or minor, but highlighting market power, which is not to say that regulators should not be concerned with anticompetitive behavior, risks an overemphasis of preventing the slightest infraction that one of the reasons motivating restructuring–regulatory inefficiency–is left by the wayside. Instead, the discussions should be on how to improve the efficiency of the electricity industry, which requires comparing the benefits and costs of regulation with the benefits and costs of a competitive electricity market (including the costs associated with the possible exercise of market power). Such a comparison will likely lead to better policy than what appears to be at times, although perhaps slightly exaggerated, a Victorian emphasis on market power.

Whether you are motivated to learn about electricity restructuring or if you are an expert trying to gauge which side the debate is leaning, this book is likely to be helpful. The novice has a "Readers' Digest" version of the debate, and the veteran has the opportunity to evaluate the authors' success in explaining and condensing this difficult but important subject.

Frank Felder
The Economics Resource Group, Inc.
Cambridge, MA

* * * *

The Energy Crisis: Unresolved Issues and Enduring Legacies by DAVID LEWIS FELDMAN, ed., (Baltimore: The Johns Hopkins University Press. 1996). 312 pages. ISBN 0-8018-5361-3.

The Joint Institute for Energy and Environment at the University of Tennessee commemorated the twentieth anniversary of the 1973-4 oil shocks with a symposium. The result, two years later, is the 17-paper, four-part anthology under review here. The first three sections, respectively on the crisis per se, the role of policy analysis, and responding to environmental challenges, involve a keynote paper on which several others comment. The last part consists of two views of research and development (fragmentary views by Chauncey Starr, the first head of the Electric Power Research Institute, and Christopher Flaven of Worldwatch presenting his usual points), praise serenely ignoring devastating external criticisms of the Tennessee Valley Authority by two employees, Kathryn Jackson and Verrill Norwood, and a review of current policy by Peter Fox-Penner of DOE.

The first part on energy policy is anchored by a paper by Douglas Bohi and Joel Darmstadter of Resources for the Future (RFF). The commentators were A. Denny Ellerman of MIT, Allan Pulsipher of LSU, George Horwich of Purdue, and John Berry of the *Washington Post*. Part two is centered on a paper on energy analysis by William Hogan of Harvard with comments by Michael Canes of the American Petroleum Institute, Glenn Schleede, a consultant with a long career in industry and government, and David Greene of Oak Ridge National Laboratories. Dennis Anderson of the World Bank is the keynoter on the environment and his commentators are Richard Morgenstern also of RFF and Robert Bohm of the University of Tennessee.

The book and the individual papers suffer from seeking breadth at the expense of depth. As far as I was concerned, the book could have been vastly improved by omitting the last eight papers, shortening the editor's comments, and giving the space to the other eight papers. The editor prepared a Chapter 1 that wastes 19 pages summarizing the already too summary papers. While much of his discussion accurately conveys the contents of the papers, Friedman ends with conclusions that are both questionable and not supported by the papers. The worst is stating without comment that a Department of Energy exists and implements a national strategy. More generally, he acts as if the papers as of equal merit and concludes government intervention is "neither a cure-all or a curse." The best papers stress how accursed the policy was. This overview of the book is supplemented by overviews of each section.

The section on energy policy is particularly hobbled by lack of space. Bohi and Darmstadter try to deal in 37 pages with all the major issues of energy policy. This includes the rise of world prices, the influence of preexisting public

policy, the role of concerns related to the environment, resource pessimism, and efforts, particularly by Amory Lovins, to foster new technologies, the new policies, and their impact. Predictably, the paper has variable success at handling the issues. The reader gets a clear view that pre-existing public policies and those developed during the crisis were ill-conceived, that the alarmist views about scarcity and how to deal with it were questionable, that the macroeconomic impacts were exaggerated, and that vigorous marketplace responses to higher prices were the main form of response to higher oil prices. The weakest point was the sketchy treatments of world oil and particularly the neglect of the views of M. A. Adelman. A more minor complaint is the passing comment that "coal was in poor condition to meet growing demand and to relieve the pressure on oil." In fact, coal output, after a sharp decline in the 15 years after World War II, started growing in 1960 and has continued to do so. However, this growth has taken place only in electricity generation. The drawbacks of coal can only be overcome by use at the large scale of a modern power plant.

Each of the four supplementary papers complements Bohi and Darmstadter. Ellerman deals with three issues–world oil, domestic forces that affected prices independently of world oil prices, and research and development stimuli. The discussion of world oil is on forces at work other than OPEC. The discussion of prices shows that competition within the coal industry produced price movements independent of oil price development. (Oil prices are a ceiling on coal prices, but nothing guarantees that coal prices will hit that ceiling. The price, in fact, has persistently been in an intermediate range that is lower than needed to compete with oil in electric utilities but too high to stimulate nonutility use.) Finally, Ellerman points out that none of the massive efforts to promote energy research and development produced satisfactory results. The other three papers are no less laudable but harder to summarize. They are each a slightly different endorsement of the Bohi-Darmstadter criticism of intervention. Comments here are limited to a quibble. Horwich asserts without substantiation that support for intervention came from academic as well as government economists. The closest thing to proof provided is citation of support given by the Carter administration's Council of Economic Advisers. The Council, of course, is staffed largely by academics, but they must subordinate their public arguments to executive policies. The vast literature generated by academic economists on energy intervention overwhelmingly condemned it from the start.

Hogan, who was in charge of building a large energy model to evaluate President Nixon's project independence objective, defines his realm sufficiently broadly to cover any issue that has received some form of formal analysis. He begins by quoting a discussion of the drawbacks of models and counters that the modeling is preferable to the unordered, unreproducible thoughts of those who would shun modeling. His example is that great easy target, Amory Lovins.

Even had objections from the extremely market-oriented opposition of von Mises been treated, Hogan's conclusion still hold. Mises got the prospects right because he was dealing only with broad easily resolved issues. (Mises is extreme only in that his statements of what are largely standard viewpoints of economists are stated with a vigor he felt necessary to reach lay readers.) Others need the discipline of writing down a model.

Hogan then presents, as if it were a neat progression, the emergence of increasing preference for markets over regulation in energy. He rightfully begins with discussion of how the Project Independence model showed that the supposed goal of eliminating oil imports by 1980 could not be attained by any sensible combination of policies. He proceeds to show the emergence of recognition that markets respond to higher energy prices, that price controls are harmful, and that neither gas distribution nor electricity were well-served by existing regulations. In the process, the focus on models diminishes.

He moves on to deal with several other issues–strategic stockpiles of oil, oil security tariffs, technological change, assertions that consumer myopia justifies intervention to alter consumption choices, and the behavior of OPEC. On reserves, he reiterates a theme that recurs through the book, that the stockpile has done no good. He and the others make the familiar complaint that the rules do not allow use of the stocks. The critics continue to overlook the simple reasons why this is the case. The stockpiles are predominantly an effort to offset the disincentive to stockpiling produced by thwarting the price increases during market upheavals that make stockpiling pay off. The same irrational fear of windfall profits also prevents use of stockpiles for fear of charges of giveaways a fire sale prices. Hogan briefly reiterates the standard case for import tariffs on oil, has a short but rambling discussion of new technology whose clearest point is that the process is too poorly understood to be well treated in models, notes the weaknesses in the case for regulating conservation, and then notes that because Adelman's vision of OPEC as an imperfectly collusive unstable cartel is correct, formal models, which necessarily must assume systematic behavior, have not well handled the issue.

Canes deals with aspects of Hogan's analysis that were ignored in the prior paragraphs, namely a classification of insights on the basis of their degree of success. Canes's main points are that Hogan exaggerates the ability to overcome strong political objections by better communication and that success is more likely when the advice is to rely more on markets. Canes contends this is explicable because economic theory better explains markets that it explains political behavior. As Canes does not note, extensive work on the economics of politics exists but concentrates on showing how badly government works.

Schleede gives a longer, more wide ranging discussion of the issues. He starts with an important point of which Hogan is surely aware but failed to note, the many errors made because of bad energy price forecasts. Schleede then has several short discussions of other aspects of Hogan's papers. The most

interesting is that he, like Canes, notes that the case for oil import tariffs involved too many uncertainties to overcome concerns about the costs. Schleede then provides nice summaries of why the Nixon-Ford energy policies failed and of what we learned from the experience. On the policies, the most interesting insights relate to the role of generalists in shaping the policies and the failure to conduct meaningful analyses. What was learned prove many examples of the superiority of markets over governments. Then Schleede discusses the implications for various areas. These include criticism of government efforts to promote technical advance by general research programs, maintaining national laboratories, pilot programs, and tax incentives. He sees the experience as warning of the defects of a government industrial policy. Another concern is over the deficiencies of environmental policy making.

Despite the prior papers, Greene valiantly supports (against the skepticism of Bohi and Darmstadter) the Oak Ridge contentions that energy shocks have profound macroeconomic effects, that OPEC could engender another price increase, and that forced conservation worked. In the last case, he picks the rules setting miles per gallon requirements for automobiles. He dutifully cites and totally ignores Robert Crandall's devastating arguments that, even if greater efficiency were desired, the standards were an inordinately expensive way to proceed.

Anderson deals meeting world energy demands and environmental goals. He believes solar energy is the answer and proposed research and development to promote this goal. Obviously, he too did not understand the papers that preceded his. Morgenstern deals rather tersely with the issues. He reiterates concern about the efficacy of government research and development support and notes the many government created inefficiencies in energy use. Bohm's ruminations involve recollection of symposia in the early 1980s that discussed many of the issues Anderson raised. Bohm recalls that in these symposia nuclear was considered a more readily available option than solar and presents overly polite musings that I hope to be suggestions that Anderson inadequately justified his choice of solar. More bluntly, he criticizes Anderson's dismissal of the role of prices in affecting energy choice; Bohm explicitly notes Anderson's failure to accept the insights of Bohi and Darmstadter.

As noted, part four attained total incoherence. Fox-Penner in the least worst effort has the unhappy task of reconciling the Clinton administration's sensibly passive energy policies with that administration's desire to appear active on all fronts. Fox-Penner pads the discussion with random observations. He claims that the Clinton administration is paying more attention to getting new technology commercialized.

From the prior, it should be clear that the book treads with variable success over familiar grounds. The interest lies in seeing how a sample of analysts who include some major actors in the debate felt in 1994. The

conference had limited participation that restricted the scope of the discussion. Thus, the audience is energy specialists who must know what various people are currently thinking.

Richard L. Gordon
The Pennsylvania State University

* * * *

Electricity Transmission Pricing and Technology by MICHAEL EINHORN AND RIAZ SIDDIQI, eds. (Boston: Kluwer Academic Publishers, 1996), 282 pages. ISBN 0-7923-9643-X

An efficient move towards competitive electricity markets rests with resolving a number of analytic challenges associated with pricing transmission services. Transmission pricing is an area that relies as heavily on physics as it does economic theory. Perhaps that is the attractiveness of the topic by some of the top minds debating electric restructuring policy issues.

The purpose of Einhorn and Siddiqi's book is to provide a compilation of transmission pricing papers that serves as a "one-stop" source for varied economic and technical viewpoints. With the assistance of the Electric Power Research Institute (EPRI), the authors have put together a 12 chapter compilation of papers which can be categorized into four broad areas: institutional, pricing, international comparisons, and technological innovations.

The book begins with a reprinted 1994 article from the *Electricity Journal* by Larry Ruff. In the article, Ruff makes the point that electric restructuring cannot move forward without some form of bifurcation between the ownership and operation of the transmission system. Many will find the article somewhat dated; however, the chapter does serve a useful purpose in providing a historic context for the idea.

Chapter 4, by Jack Casazza, provides a colorful discussion of a number of other institutional changes that will occur in a competitive retail market. His contribution gives particular emphasis to the changing relationships between institutional players (namely utilities) from one of informational and operational cooperation to competition. He also examines the potential impacts that could potentially occur to different stakeholder groups as a result of moving to a third party access regime.

The core "pricing" section of the book is composed of 5 chapters. This section includes a number of excellent articles on current and future thinking about electricity transmission pricing issues. In Chapter 2, William Hughes and Richard Falak provide an excellent overview of the past, present and future of electric transmission pricing. Their survey assesses various approaches to

transmission pricing and their impacts on wealth distribution, economic efficiency, and other practical considerations. Chapter 3, by Ignacio Perez-Arriga, et. al., discusses some fundamental problems with marginal pricing of transmission services. They argue that short run marginal pricing fails to recover network revenues due to the discrepancies between static and dynamic analysis, economies of scale, the discrete nature of transmission investments, and reliability, environmental, and other constraints on the system.

Chapter 5 (Thomas Parkinson) treats two alternative arrangements that were advocated in California's electrical restructuring initiative. The purpose of the chapter is to highlight the potential benefits of moving to a market structure based upon voluntary cooperation between suppliers, rather than an involuntary administrative process, to determine the rules governing economic dispatch and spot markets. Parkinson speculates that a voluntary structure, which he refers to as a "supplier model," would lead to an easier and less contentious framework for managing competitive electricity markets.

Chapter 6, by Graham Shuttleworth, discusses the differences in pricing structures between a system where transmission access is offered by a vertically integrated utility and access is offered by an independent network. Shuttleworth's contribution is similar to other chapters in that it argues that embedded pricing structures (top down pricing) will have to be abandoned in a competitive market place. Shuttleworth argues for a bottoms up approach to pricing transmission services that allows for short term tariffs and long term contracts. For efficiency, both of these approaches will have to take into account the costs of building capacity, the costs of marginal losses, and the costs of congestion.

No discussion on transmission pricing would be complete without a contribution by William Hogan. In Chapter 7, Hogan draws close attention to the fact that Direct Current (DC) models work well as a means of generally determining locational spot transmission prices when thermal capacity constraints exist. However, since this model ignores reactive power constraints, it tends to fail in describing locational spot prices when voltage constraints become a real problem for transmission systems. Hogan recommends the use of a full Alternating Current (AC) model to determine real and reactive spot power prices.

Chapters 8, 9, and 10 present international perspectives on transmission pricing from New Zealand, Australia, and Norway, respectively. These chapters discuss different approaches to transmission pricing that have been practiced in other countries. Chapter 8 (Brendan Ring and Grant Read) discusses New Zealand's approach of determining short run transmission prices through observed system dispatch (reflecting differences in locational marginal costs and demand). Chapter 9 (Hugh Outhred and John Kaye) outlines the Australian model of transmission pricing that uses a "nodal auction market." The model

uses a computer-based auction procedure to address both spatial and temporal issues. Chapter 10 (Einar Westre) discusses Norway's approach at designing transmission rates that capture variable costs (marginal line losses and congestion costs) and fixed costs (to cover the remaining electricity grid costs).

Chapters 11 and 12 by Narain Hingorani and Karl Stahlkopf, respectively, present a technological discussion of new transmission technologies that will affect the way in which transmission services are offered and priced. Both chapters discuss exciting innovations in Flexible AC Transmission Systems (FACTS) and their implications for future transmission service operations.

Einhorn and Siddiqi claim that they have abandoned the traditional role of editors and acted more as compilers in organizing this text. Yet the book has a good deal of uniformity in both context and organization. Each chapter has complete references as well as endnotes which will be useful to readers seeking additional information on transmission pricing ideas. This uniformity was no doubt the result of a conscientious editorial effort for which the authors should be applauded.

The book will appeal to scholars and practitioners focusing their efforts on the electricity restructuring debate. The book would make an especially good companion text for instructors teaching courses in energy economics where electric power industry restructuring may be covered as a special topic. The book could also be used as a companion text and reference for a multidisciplinary course preparing future electric power industry professionals or for a continuing education course to energy professionals on transmission pricing issues.

David E. Dismukes
Center for Energy Studies
Louisiana State University

* * * *

Maintaining Energy Security in a Global Context, by WILLIAM F. MARTIN, RYUKICHI IMAI, AND HELGA STEEG, (The Trilateral Commission, 1996), xiv+117 pages. no index. ISBN: 0-930503-73-2.

The authors of this report have held high government office in the USA, Japan; and Germany and the IEA (Mme Steeg). They consulted 67 persons in North America, 94 in Europe, and 24 in Japan. "Energy security has three faces". . .: "vulnerability to disruption" of Persian Gulf supply, "adequate supply for rising demand," and "the energy-related environmental challenge." (Page 4). After three chapters on supply, there is a bird's-eye view of

governments and markets in the trilateral countries, investment in the Caucasus region, energy developments in developing countries, nuclear power, and the environment. They give much policy advice, prefer market mechanisms to governmental, but say little about either kind of tool. The connection of later chapters with "security" seem tenuous.

They expect that "dependence of Persian Gulf exporters will climb back to almost half of world oil supplies by 2010" (page 5). No reason is given. But since 1989, despite production decline in the USA and collapse in the Former Soviet Union—both now leveling off—the surge in non-OPEC "all other" production has kept the Persian Gulf share of world supply at or just below one fourth. They expect non-OPEC to hold their own: a welcome change from the old consensus that they would go swiftly downhill. (Earlier, even OPEC was said to need higher prices to satisfy demand. [D. Gately, J. Econ. Lit., Sept. 1984, 22(3), pp. 1100-14]). However, level non-OPEC output is still an assumption without proof. If true, it would be irrelevant.

The authors think an oil crisis results from a supply "shortfall," they allege 9 percent in 1973-1974 (page 13). But the amount consumed tells nothing about the amount that buyers were trying to buy, which determined the price. A demand curve shift, like a wind shear, may do great damage, but cannot be seen. In 1973, some Arab countries reduced output for two months. The cutback amounted to less than the net increase in OECD inventories early in the year. But frightened buyers' precautionary and speculative demand, for hoarding not use, sent prices far up.

In 1978-79, even after the Iranian Revolution, capacity exceeded consumption. But the holders of that capacity—most notably Saudi Arabia and Kuwait—declined for a time to use it all. Not without reason, buyers were again scared and again bid up the price. [Adelman, *The Genie Out of the Bottle*, 1995, pp. 170-173]... The International Energy Agency fluttered like a moth, looking in vain for the "shortfall." The writers still believe there was one. In fact, output kept exceeding consumption even as prices rose. In 1990, oversupply had been driving down prices. Iraq scared some producers into cutting back, was hailed as policeman, but then chose to play robber. In 1990, Saudi Arabia waited only six weeks to raise its output, a helpful change in behavior.

In every crisis, there was more than enough capacity to meet demand at existing prices. Hence the writers' worry about there not being enough capacity has no tie with reality. A crisis is possible any time, as long as a few producers' output cuts can jolt the price up. Since inventory-building triggers the crisis, only some kind of inventory-offset will mitigate it. The authors approve of strategic stocks but never explain the use. Some think stocks to preclude trade panic are a public good. Some disagree, and would leave all stock building to private action. The authors cannot reach the issue because they never say what

stockpiles are for. They want OECD to "urge [non-members] to build strategic stocks" (p.17). They omit any mention of cost.

The omission is more glaring when they discuss the industrializing countries, aside from repeating "dependence on the Persian Gulf" (p. 50). "[E]conomic growth the [China's] top concern, not protection of the environment." (p. 58; also p. 89). They suggest foreign assistance. Now, China (and India) use huge amounts of very dirty coal, hauled on overburdened railroads and uneconomic coastal ships. They would benefit and grow faster if they let prices work to phase out much of this stuff. Of course, they would like us, in the name of environmental impact, to pay them to do what benefits them. The report would encourage China and India to demand help and delay reform. Perhaps it would benefit the environment if they did more than what benefits only them; if so, we might given them emission credits. Such decisions require an economic analysis which the book does not encompass. It never starts to analyze or explain "maintaining energy security."

M. A. Adelman
MIT, Cambridge, MA