

Book Reviews



A. Lawrence Kolbe and James A. Read, Jr., with R. Hall, *The Cost of Capital: Estimating the Rate of Return for Public Utilities* (Cambridge, Mass.: M.I.T. Press, 1984).

The Cost of Capital grew out of a project by Charles River Associates for the California Public Utilities Commission. Its purpose is to provide both participants in utility regulation and students of the industry with an introductory guide and reference manual on determining the cost of capital for a regulated utility. The reader needs some background in financial theory to appreciate many of the finer points of debate about techniques for estimating the cost of capital and the theoretical and practical problems involved. However, even without such a background, one can gain insights into the issues that bear on permissible returns for utilities and the various methods for determining the rate.

The text is organized as a primer. It first addresses the cost of capital, the allowed rate of return, and the equity issue involved. This provides an introduction to business and financial risk and a discussion of the need for parity between the cost of capital and the allowed rate of return. With this background, five methods for establishing the cost of capital are evaluated. These are: (1) comparable earnings; (2) discounted cash flow; (3) capital asset pricing model; (4) risk positioning; and (5) market-to-book ratio. The methods to be evaluated were chosen on the basis of current or likely future frequency of use, and/or subtle problems in application.

The five models are evaluated theoretically, practically, and empirically. This threefold structure was designed to test whether each model can, in theory and in practice, correctly estimate the cost of equity. The book also describes the difficulties in implementing each method and analyzes each one's historical performance. The theoretical and practical evaluations are well done—sufficiently detailed and well referenced. The reader can easily gain an understanding of the strengths and weaknesses of the various estimation techniques. Those interested in more detailed discussions can find appropriate references to the literature.

The empirical tests for the methods of estimation are less well executed. The first test is an analysis of how well each method tracks government interest rates of varying maturities. Such a test ignores the fact that the government interest rates may not be affected by market forces in the same manner or to the same degree as utility capital costs. The authors note that in the 1973–1974 period (during the oil embargo), utility costs, as estimated by the various techniques, were higher than government interest rates. This would seem to be an expected result, but the authors argue that any divergence from the government interest rate path is incorrect. The second empirical test measures the stability of parameters in each method, in terms of the range of the parameter over a 10-year period. This discussion entirely ignores the variance of the parameter estimates and possible changes in the parameters to reflect changes in risk. For example, it is known that the CAPM beta may decrease in response to increases in risk, seemingly perverse behavior. Such issues are not addressed at all in the

empirical evaluation of the estimation techniques, which overall is not very enlightening.

In general, readers without a background in either finance or utility regulation will find this book difficult to use, because it presumes some knowledge of finance and economics. For industry practitioners, this book can provide insights into many of the theoretical debates about estimation techniques and guidance in the analysis of the results.

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Charles F. Phillips, Jr., *The Regulation of Public Utilities: Theory and Practice* (Arlington, Va.: Public Utilities Reports, 1984).

Phillips has compiled a massive survey of the subject. The book begins with an overview, proceeds to an elaborate review of regulatory practices, presents overviews of the four covered sections (electricity, gas, telecommunications, and water), and concludes with a chapter on the future of regulation. The result is a useful collection of facts and a rich citation of the literature.

After an initial chapter of miscellaneous facts about public utilities, Phillips presents discussions of the relevant economics, critical court cases, and the nature of regulatory commissions. The section entitled "The Theory of Public Utility Regulation" deals with (1) goals, (2) controls over accounting and financing practices, (3) definition of expenses of providing services, (4) valuing assets, (5) deciding what constitutes a reasonable return on investment, (6) designing rate structures, and (7) controls over service, safety, and management practice.

This section constitutes nearly half the book and appears the most useful part. Each chapter both discusses economic writings on the subject and reviews regulatory practices. The practice of regulation is well described, but the economic discussions tend to summarize conclusions rather than to present the analyses. (Similarly, Phillips's earlier chapter on economics tries to present the critical material in 31 pages.) Although the footnotes seem to cite a sizable portion of the relevant literature, the absence of a bibliography unnecessarily complicates the identification of the mass of useful material. However, any economics course on public utilities could find the book a useful complement to the more analytic studies available.

The contents of the chapters are not always what might be expected. The legal chapter deals straightforwardly with the wide discretion courts have given governments to regulate. The discussion of commissions contains a useful review of who they are and how they operate, and a superficial discussion of whether independent commissions are effective instruments; it also notes the problem of simultaneous state and federal jurisdiction.

The goals, procedures, and theories chapter briefly outlines what commissions might seek to accomplish, sketches the nature of the rate regulation process that subsequent chapters develop in detail, nicely reviews the hearing process, and notes the various theories, such as capture and public interest, that have been proposed to explain commission behavior. Phillips validly concludes that none is fully satisfactory, but tends to underrate the capture problem.

The remaining chapters on regulatory practice cover the appropriate topics and give a reasonable sense of the prevailing practices. Among the more unconventional elements are a consideration of natural gas field pricing and nuclear regulation. The absence of extensive economic analysis is exacerbated by occasional errors. For example, Phillips asserts that the failure to adjust for inflation of utility assets is inefficient only if it is worse than the understatement of asset values in unregulated companies. This improperly generalizes an argument about tax distortions of inflation. It seems to ignore that inflation pushes up the prices of unregulated firms, whereas regulated firms can respond to rising nominal demand only if the regulators allow rate increases.

The electric utility chapter handles holding companies, reliability councils (with a failure to note that NERC is now the North American Electric Reliability Council), the Federal Energy Regulatory Commission, other Department of Energy regulations of electricity, and federal, state, local and cooperative entities. Again we get many facts and little analysis. The worst flaw is that the discussion of holding companies stresses the alleged evils of the 1920s and gives too little attention to the ossification of industry structure caused by the barriers to reorganization.

The gas chapter is predominantly a well-done review of the debate on field pricing. The case against controls is well presented, but Phillips adds qualifications about the alleged transition problems with decontrol. The telecommunications chapter is a straightforward review of the telephone industry and its regulation. A similar approach is taken to water.

The conclusions chapter summarizes the failings of regulation and follows the public utility tradition of proposing better techniques of regulation. Those who feel the problems are more serious will be disappointed. Phillips cites but does not discuss the modest, moderate, allegedly more acceptable proposals for reform. He shows no recognition of the even stronger critiques that have been raised.

Regulation is effectively bargain-basement Lange-Lerner socialism. Hayek, who effectively demolished the Lange-Lerner case, as even Paul Samuelson recognizes, argues that regulation can never be made to work. The problems are so severe that regulation may be worse than reliance on such market pressures as exist. Proponents of the natural monopoly argument tend to forget that while we may need only one electric or gas company, competitive pressures are exerted by interfuel competition, self-generation, and, increasingly, the need to deal with a utility in another region.

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Louis Turner, *Coal's Contribution to U.K. Self-Sufficiency* (London: Heinemann Educational Books).

Richard Eden and Nigel Evans, *Electricity's Contribution to U.K. Self-Sufficiency* (London: Heinemann Educational Books).

Colin Robinson and Eileen Marshall, *Oil's Contribution to U.K. Self-Sufficiency* (London: Heinemann Educational Books).

These pamphlets are the first three of a planned seven-pamphlet series on British energy prospects. The others are to cover (1) gas, (2) conservation, (3) a synthesis, and (4) an appraisal of the overall economics of energy self-sufficiency (to be done by Marshall and Robinson). Unlike all too many treatments of self-sufficiency, these studies take a hardheaded approach. They examine economic efficiency and ask whether self-sufficiency is actually desirable.

Only Robinson and Marshall extensively (and negatively) appraise efforts to alter fuel use patterns. The other two studies are almost entirely efforts to delineate possible future patterns in coal and electricity.

Turner undertakes the difficult task of explaining and evaluating the various views about the prospects for British coal. Only one element of the situation—the prevailing cost structure of British coal mining costs—has been clearly delineated. The costs were disclosed in an extensive review of the National Coal Board by the Monopoly and Mergers Commission. (Turner considers this—and I agree—a particularly useful review). Future developments will depend on several difficult-to-predict developments: the trend of world coal demand, differential technical progress in coal mining and transportation to different regions, depletion of coal, and the strength of the British pound.

Turner's focus is properly on the most tangible elements of the situation—the nature of coal supply curves in the countries best able to supply Britain. He takes as his starting point submissions to the British inquiry on the proposed Sizewell nuclear plants. Because the plant decision is expected to have a major impact on the direction of future British electric utility fuel use, a wide-ranging review was undertaken. The Coal Board, oil companies, and the Central Electric Generating Board expressed views on coal market developments. The Electric Generating Board is the most pessimistic about imported coal, expecting very high prices—at least \$88 dollars and possibly as much as \$140 per metric ton. The Coal Board talks of \$68 to \$104 per metric ton of coal.

While it is difficult to tell precisely from Turner's deliberately limited discussion, the practical difference between these two views is relatively minor. At the most likely levels of world coal trade, both observers predict prices in the \$90–100 range—high enough to protect British coal from competition. Oil companies, in contrast believe that a \$60 price is more likely. In that case, a continuation of British output at a level of 100 million tons or more would require that British costs remain constant and the pound remain weak. Turner is suspicious of the high cost forecasts because they imply a discontinuity in world supply. For some reason, the forecasters contend that little incremental supply exists at prices between \$60 and \$100. Turner sensibly considers this implausible.

He concludes by delineating the possibilities, starting with a combination of circumstances (British coal demand of 116 million tons, a \$1.50 exchange rate for the pound, constant British coal mining costs, and 300 million tons of coal trading internationally at \$65 per ton) that would lead to a strong British industry—capable of providing 130 million tons. He then suggests some factors that could put pressure on domestic output. The reasonable conclusion is that Britain should be more receptive to coal imports, possibly used in plants located where a shift to domestic coal would not be prohibitively expensive. He suggests that greater efforts be made to clarify import supply prospects.

Eden and Evans range more widely, but less deeply, than the authors of the other two pamphlets. They seek to cram into 85 small pages a review of power prospects related to overall energy trends in Britain. Four chapters (the last preceded by a discussion of extant and planned capacity) present a range of scenarios of energy and electricity generation patterns.

The penultimate chapter provides the critical discussion of the barriers to attaining various outcomes. The key problems are taking steps fast enough to implement high nuclear scenarios. Eden and Evans's review includes an examination of whether Britain could benefit from the substantial French capability for building nuclear plants. Next, they indicate the costs of electric power under different scenarios. The chapter concludes with a qualitative review of ways to alter demand and supply conditions.

The final chapter deals with the import costs of alternative futures. The "large" (2–4 percent of gross domestic product) import levels are seen as a source of concern. This incomplete analysis mars an otherwise useful review.

Robinson and Marshall make a particularly valuable contribution by carefully focusing on a precise issue—does it make sense to impose policies that would cause extraction of British North Sea oil at a slower or more rapid rate than companies would adopt? The authors present a careful, lucid discussion of the relevant economics.

Repletion, as more rapid extraction has been described, is seen as unattractive. At best, some efforts to encourage higher recovery rates may be justified by the social benefits. Slowdowns in production impose direct costs that could have indirect benefits such as reducing disruption costs. Robinson and Marshall, however, argue the benefits are probably small.

They also warn of the severe administrative problems that would arise if efforts were made to alter production patterns. Battles for aid would be waged by oil companies. Policymakers would have no good basis for decisionmaking.

All this proves an effective use of economic analysis to elucidate policy issues. The approach is much in the spirit of the best work in the area. It can be useful to both those wanting to learn more about energy and those wishing clear demonstrations that economic principles can help clarify policy problems.

The other pamphlets are also useful additions to the literature. In particular, they offer U.S. readers a sense of the similarities and differences between energy problems in the United States and Britain.

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Leonard S. Hyman, *America's Electric Utilities: Past, Present, and Future* (Arlington, Va: Public Utilities Reports, Inc., and Merrill, Lynch, Pierce, Fenner & Smith Inc., 1983).

Leonard Hyman describes this book as an introductory work, designed to explain how the electric utility industry developed, how it is regulated and financed, how it operates, and where it is going. He notes modestly that the "required principles of accounting, engineering, finance, law and physics are explained in the text." This ambitious objective is only partially achieved.

The author presents capsule summaries of the technology of electricity supply, utility operations and planning, the components of the ratemaking process, and elementary accounting as applied to the balance sheet, income statement, and flow-of-funds statement. These summaries are complemented by similar brief surveys of the historical development of the electric utility industry, the origin of commission regulation, the rights and obligations of public utility status, and some of the better-known criticisms of economic regulation.

This type of information will be of value primarily to the practitioner who is coming to electric utility regulation for the first time. The format of the book is easy to follow, and the only organizational problem is that the discussion of techniques for estimating revenue requirements and the cost of capital precedes the introductory explanation of accounting and financial tools by two chapters.

Hyman is particularly successful in presenting a concise history of the industry. He offers an appreciation of the roles played by Thomas Edison, Samuel Insull, Franklin Roosevelt, and others, as well as insights into the holding company manipulations of the 1920s and the New Deal reforms of the 1930s. The treatment of the industry in the postwar years is somewhat less satisfactory, and the reader must sift through a welter of tables and detail that are only partially explained. The astute reader may also challenge the author's contention that the industry went into a decline after 1965 because management did not (or could not) raise prices fast enough.

The kaleidoscopic approach used in this volume poses the risk that important issues will not be treated in sufficient depth and that the interrelationship between these issues will be obscured. This problem plagues Hyman's study in four areas.

First, there is only a cursory review of utility forecasting and capacity planning techniques, and no critical evaluation of the adequacy of these techniques in dealing with the structural and institutional changes that transformed the industry in the 1970s and early 1980s. There is no discussion of the appropriate economic criteria essential for reevaluating investment plans, terminating projects increasingly burdened by cost overruns, or exploring cost-minimizing alternatives. Furthermore, there is no indication of what criteria should be employed in the future when suboptimization may become a major problem.

Second, Hyman gives too little attention to the options for handling excess capacity, cost overruns, and project cancellations within the context of rate base regulation. The appropriate application of the prudence and used-and-useful tests in handling these problems is currently a subject of intense debate. Accordingly, the reader should be introduced to the major efficiency and equity issues involved in considering each public policy option. In particular, a book of this sort should analyze the various phase-in schemes that have been proposed as methods for making an intergenerational

distribution of the burden of redundancy and cost overruns between consumers and shareholders.

Third, Hyman's handling of electricity pricing and rate design does not give adequate attention to the reform movement of the 1970s and the great rate debate between the traditionalists and the marginalists. The explanation of marginal cost pricing is particularly truncated; it gives no explanation of the difference between short- and long-run marginal cost or the difference between a marginalist and a traditionalist approach to the integration of cost structures into the design of peak and off-peak rates. In addition, antimarginalists will be displeased to find that there is no comprehensive treatment of the problems of implementing marginal cost pricing.

Fourth, inadequate attention is given to the causes of utility diversification and the implications for both shareholders and public policy. This omission is particularly difficult to explain because the author is obviously sympathetic to the financial problems of the industry. When the flow of funds exceeds the demand for new capital, utility management has a strong incentive to diversify into other regulated and nonregulated activities. Such diversification may or may not yield gains in the form of financial synergism for the shareholder. Furthermore, diversification (especially when achieved by creating holding companies) poses new sets of problems for the regulator. An exposition of these problems might have given the reader a better appreciation of the scope of the issue.

On balance, this book will be of value to the new entrant into the world of public utility regulation. The serious student, however, will soon have to supplement, if not replace, it with the more advanced literature in this field.

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Paul L. Joskow and Richard Schmalensee, *Markets for Power: An Analysis of Electric Utility Deregulation* (Cambridge, Mass.: M.I.T. Press, 1983).

Markets for Power is an important and timely analysis of the possibilities for improving the performance of the electric utility industry through deregulation—a proposal that has received much support in recent years. Those who advocate rapid deregulation of electric power along lines recently established in transportation, telecommunications, and finance will be disappointed by Joskow and Schmalensee's conclusions. Though their approach to deregulation is sympathetic, their analysis indicates that the economic, technological, and institutional characteristics of the electric utility industry are not conducive to the easy development of workably competitive markets. Simple cessation of price and entry regulation would lead to unregulated monopoly and greater inefficiencies than those that plague the industry

today. The authors recommend regulatory reform along conventional lines, coupled with deregulatory experiments in areas where conditions are most favorable to market competition.

Though the policy conclusions are important, this reader was most impressed by the analytical skill and knowledge that Joskow and Schmalensee bring to bear on their subject. Sophisticated economic theory, electric power technology, and complex institutional relationships are integrated to create a comprehensive and easy-to-understand framework for analyzing the electric utility industry. Within this framework the authors evaluate a spectrum of deregulation scenarios, ranging from modest deregulation of wholesale power rates to fairly complete deregulation within a vertically disintegrated industrial structure. Potential market failures appear under each of the scenarios and at every level of operations—distribution, transmission, and generation.

Electric utility distribution systems are described as having pervasive natural monopoly characteristics, and rate regulation of franchised distribution monopolies is accepted as the most efficient alternative at the retail level. Dual distribution systems, fringe competition, demonstration effects, and potential entry via cogeneration, wind and solar power, and so on, are dismissed (somewhat summarily perhaps) as workable alternatives to traditional rate regulation.

The central contribution of the book is the description and analysis of the contractual relationships that would have to be developed in bulk power markets, which provide the most obvious opportunities for deregulation. The technological interdependence between generation, transmission, and distribution requires an extraordinary degree of vertical and horizontal coordination. This places a heavy burden on marketlike arrangements. Asset specificity, immobility, informational asymmetries, uncertainties, and the probability of strategic and opportunistic behavior of contracting parties combine to preclude reliance on simple spot market transactions. Instead these considerations dictate either long-term contractual relations or full vertical integration. The authors provide an excellent analysis of the potential of long-term contracts in a deregulated regime. Its effect is more to disabuse the reader of simplistic notions about the power of markets than to support deregulation or vertical disintegration.

The efficient generation and delivery of power is, in many respects, a joint venture. The authors emphasize that most of the unexploited economies available in the existing power system require improved interconnections, expanded power pooling, and central dispatch combined with monopolistic transmission. Improvements in these areas call for complex risk sharing and collective bargaining and consequently reduced autonomy of individual operating units. These features are, to a considerable extent, inconsistent with market competition, and call for cooperative or joint arrangements that probably would conflict with the nation's antitrust laws.

Though radical deregulation of all bulk power transactions would not be desirable, the authors do not reject the possibility of deregulation. Rather they recommend deregulatory experiments and a step-by-step, "feel-our-way" approach. They also recommend stepped-up regulatory initiatives to reform rate levels and structures, reorganize marginal units (via merger) in order to exploit economies of scale, and improve power pooling arrangements.

The authors emphasize the complexities of the institutional arrangements required under deregulation and are skeptical about the ability of competitive markets to cope

with these complexities. They give little or no attention to the performance of other industries with complex vertical relationships that function in a less stringently regulated environment. Production, refining, and distribution in the petroleum industry, for example, might have provided some instructive parallels and ameliorated some of the uncertainties about the efficiency of the conceptual arrangements that might emerge in deregulated bulk power markets.

Markets for Power is a benchmark contribution to the economics of the electric utility industry and a model for the economic analysis of technologically complex industrial structures. The book is easy to read and understand, and contains excellent bibliographic references to both technical and policy-oriented literature. It should be read not only by those interested in the issues specifically addressed, but by those who have a general interest in the application of microeconomic theory.

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J. E. Peterson, ed., *The Politics of Middle Eastern Oil* (Washington, D.C.: Middle East Institute, 1983).

This book presents some 30 articles on OPEC's price revolution in the context of regional politics and the global economy. The articles reprinted or excerpted were published between 1968 and 1982, and the authors include prominent scholars, diplomats, and journalists (Edith Penrose, James A. Bill, H. F. Eilts, and Eric Rouleau, to name but a few). On some of the more controversial aspects, opposite views are often presented. Walter J. Levy's lament on "Oil and the Decline of the West" is followed by Eric Davis's view on the "emerging alliance" between Saudis and Americans, and William R. Brown's reminder that "the Arabs probably do not have the capability to create an oil shortage in the United States." Harold Brown's insistence on an expanded American military presence around the Gulf is followed by Christopher Van Hollen's plea for a "'laid-back' rather than a forward military posture."

The editor's introductions to each section add up to a judicious overview and help provide a historical framework and logical coherence for the presentation. There are useful chronologies in the appendix on OPEC's rise since 1973, the Iranian revolution, and the Iraq-Iran war. A comprehensive bibliography of books and articles would have been even more helpful if classified by subject matter (although the introduction to each section of the text provides useful numbered cross-references).

Peterson explains that he began selecting these materials some time ago for an undergraduate course, and college teachers throughout the country will be indebted to him for putting the results into print. They add up to a balanced and highly readable introduction to a complex subject.

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Richard L. Gordon, *Reforming the Regulation of Electric Utilities* (Lexington, Mass.: Lexington Books, 1984).

Events of the 1970s and 1980s have focused a great deal of attention on the electric utility industry. Consumers have been reeling from rate shock, first as OPEC forced up fuel prices in 1973 and 1979, and now as costly new generating capacity comes on line—much of it nuclear and nearly all of it initiated in an economic and regulatory climate considerably different from today's. Utilities are reeling, some nearly to the point of bankruptcy, from the revenue requirements imposed by this new capacity (much of it now unneeded). Finally, investors are reeling from the default of the bonds sold by the Washington Public Power Supply System (WPPSS) to finance its ill-fated nuclear plants and the threatened insolvency of Consumers Power Co., Long Island Lighting Co., Public Service of New Hampshire, and Public Service of Indiana.

In *Reforming the Regulation of Electric Utilities*, Richard L. Gordon argues convincingly that regulation has been a major (although certainly not the only) contributor to the current ills of the industry, and that reform is necessary. His purpose in the book was to bring together everything—economics, technology, institutional structure, and the current regulatory framework—necessary to understand the effects of utility regulation. On the whole, he succeeds in his efforts, especially in his discussion of the many layers of regulation—often overlapping, and not infrequently contradictory. As one who has done research on the electric utility industry for the last dozen years, I was simply amazed at the mass of regulation the industry faces. Gordon describes this well.

The book falls into three parts. Chapter 2 (with several associated appendices) focuses on the economics of the electric utility industry. This is the most disappointing part of the book. The discussion of electricity demand is superficial, and only those who are already knowledgeable will comprehend Gordon's discussion of electricity supply in terms of deriving the marginal cost curve in the face of time-varying demand. The same is true of the appendix on investment analysis. Dennis Anderson's book on electricity economics is much superior to Gordon's presentation.

Chapters 3 to 6 focus on the many layers of regulation of the industry. The structure of the industry is discussed, together with the forms and types of regulation it faces. The discussion and analysis are excellent, and much interesting information is presented.

The third part of the book, Chapter 8, attempts to measure the impact of regulation. It is not clear that the author has actually measured the impact of regulation per se, though he has convincingly established that the cost of supplying electricity is much greater than what state utility commissions (as of 1980) were willing to grant in rates. Nevertheless, this is one of the most useful chapters in the book because of the large amount of detailed cost data that is tabulated.

The final chapter summarizes and discusses strengths and weaknesses of various types of regulatory reform, from complete deregulation of generation and transmission to centralization of regulation in the federal government. Gordon offers no panacea—but no matter, he has done his job well. Something has to be done to rationalize the present system. If action is not taken voluntarily, events will force it

by default. The book is recommended to everyone concerned with the current problems of electric utilities.

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J. Darmstadter, H. H. Landsberg, and H. C. Morton, with M. J. Coda, *Energy Today and Tomorrow* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1983).

This small book embodies the virtues readers have come to expect from RFF books about resources, but also the usual drawbacks. It is clearly and well written, with excellent presentation of data. I have used it as a text in a junior-level course on principles of mineral economics, and it was well received by the class. The content is entirely appropriate and needs no comment. Thus I focus here on its drawbacks.

The book is so careful to cover all possible viewpoints and to cover all the bases of any issue that it never, even implicitly, takes a position on any issue. It is bland and, in a very real sense, boring. For example, the epilogue, "Living with Some Chronic Issues," raises and discusses some very important issues. But each discussion consists of several paragraphs, each starting with a phrase like "one view is that," "another view is that," or "different views are also held." The reader is then asked to consider the issue. While it is useful to have such a balanced presentation of issues, the questions have been drained of all passion, and no sense of their urgency or of the consequences of alternative actions is communicated.

RFF should not necessarily produce a case for a specific policy, but books like this one would be more useful texts and have greater impact if they did advocate a bit. The environmental movement has learned how to present arguments and how to excite. This book informs, but does not excite. One cannot find selected quotes that take stands on any issue. Darmstadter and Landsberg have been involved for decades in energy research—I believe the reader would like to know where they come down on some major issues. Instead, as the foreword explains, they deliberately avoid taking positions:

"Most books about energy are written from a given vantage point, and this one is no exception. It is written from an economic perspective. Although the book takes into account technological, political, and social factors, it places particular emphasis on economic ones—that is, how prices govern the availability, use and conservation of energy resources. The authors are especially concerned with the role of the marketplace in facilitating energy choices and in determining how these choices affect economic growth, environmental integrity, national security, and other social goals. But limitations of the market place also lead them to consider the role of government.

A book by physicists, biologists, engineers, or political scientists would have a different emphasis. But from whatever perspective a book about energy might be written for the general reader, it would cover certain fundamental issues. Darmstadter, Landsberg, and

Morton have tried in this volume to identify and analyze these key issues and to be fair and balanced in their treatment of them (p. xiii)

The book covers energy consumption patterns, energy resources, research, competition and regulation, environmental impacts, and international problems. The authors have been so fair and balanced that they give none of the flavor of the atomic energy conflict or the energy/environmental tradeoffs. As a reader and a teacher, I prefer to have a clearly stated viewpoint to challenge mentally or to refute in class. I hope that some day the authors will communicate their own judgments and values to the world. Such a contribution would be very valuable, from an energy policy viewpoint.

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Bruce A. Ackerman and William T. Hassler, *Clean Coal/Dirty Air* (New Haven and London: Yale University Press, 1981).

The 1977 amendments to the Clean Air Act (CAA) eliminated many cost-effective sulfur dioxide (SO₂) control alternatives once available to operators of coal-fired electric power plants. These amendments included New Source Performance Standards (NSPS) that forced all coal-fired plants to employ flue gas scrubbers to control SO₂ emissions.

The full or universal scrubbing option was implemented partly because of a flaw in congressional interpretation of the CAA, which facilitated the formation of an odd coalition supporting universal flue gas scrubbing. This coalition consisted of environmentalists and individuals with a vested interest in the production and marketing of relatively high-sulfur Eastern coals.

Universal flue gas scrubbing was a way for Eastern coal interests to neutralize the adverse impact of prior environmental policy (which required installation of scrubbers only for high-sulfur coal). If all plants were forced to scrub, many Eastern plants would not be willing to incur the expense of switching to low-sulfur coals or oil. Instead, they would use locally available coals.

The coalition promoted universal scrubbing by influencing congressional and Environmental Protection Agency (EPA) interpretation of Section 111 of the CAA. This section directed the EPA to establish performance standards that incorporated a degree of emission control achievable through the use of the "best system" of emission reduction. Because EPA interpreted this provision as a mandate for universal scrubbing, its research provided negligible data on other, often more cost-effective, emission control alternatives. Coalition success was ensured by this failure to conduct a thorough analysis of scrubbing and of the desirability of controlling SO₂ versus other effluents.

This book attempts to identify legislative and judicial factors contributing to the creation and success of special-interest coalitions. It offers considerable insight into the political foundation of the revised New Source Performance Standards. Certain legislative imperfections allowed special-interest groups to benefit at the expense of environmental policy. Ackerman and Hassler contend that this policy failure was the result of the "artless way" the CAA statutes were written. The original CAA was drafted so as to ignore the benefits implicit in a "new deal approach" that would have created "a decision making structure capable of deploying the varieties of relevant expert knowledge . . ." The authors believe that instead of imposing rigid solutions to complex environmental problems, Congress and the courts should encourage agencies like the EPA to organize the required expertise to formulate policy properly. Implementation of these recommendations, they argue, would reduce the chances that special-interest groups would radically shift the focus of congressional or agency deliberations on environmental policy issues.

The authors also address the regulatory distinction between new and old plants, which they believe is difficult to justify if the end goal is environmental quality. Coal cleaning and the use of lower-sulfur coals are presented as cost-effective alternatives to flue gas scrubbing, but the discussion of alternatives is incomplete and does not provide new information. For example, the EPA "bubble policy" is not specifically discussed, but is relegated to a footnote. This policy (introduced in January 1979) allows companies to comply with an aggregate emission ceiling rather than meeting standards on an individual boiler or plant basis. It should have been thoroughly reviewed. A discussion of how existing structural flaws were avoided or mitigated during the implementation of the bubble policy would have been a useful contribution.

The authors devote a significant share of the book to the prospects for fine-tuning judicial and congressional procedures to address the complex issues of environmental degradation more appropriately. They believe that "nothing short of a radical transformation of Congress, or a return of air pollution to the states would have [prevented the formation of the coalition]." Additional emphasis on market-oriented schemes, such as the bubble policy, would have provided a more useful analysis of the tradeoffs implicit in environmental policy issues.

Overall, the book gives the reader insight into the significant gap between the formulation and implementation of environmental policy. The authors' ability to articulate political events in an historical context sheds light on past and present policy debates. Thus, the book is recommended for all those interested in coal-fired electric power generation or air quality issues.

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