



Winter 1965

Mullenbach, Philip, Civilian Nuclear Power: Economic Issues and Policy Formation

Samuel D. Estep

Recommended Citation

Samuel D. Estep, *Mullenbach, Philip, Civilian Nuclear Power: Economic Issues and Policy Formation*, 5 Nat. Resources J. 202 (1965).

Available at: <https://digitalrepository.unm.edu/nrj/vol5/iss1/15>

This Book Review is brought to you for free and open access by the Law Journals at UNM Digital Repository. It has been accepted for inclusion in Natural Resources Journal by an authorized editor of UNM Digital Repository. For more information, please contact amywinter@unm.edu, lsloane@salud.unm.edu, sahrk@unm.edu.

***Civilian Nuclear Power:
Economic Issues and Policy Formation***

By

PHILIP MULLENBACH

New York: The Twentieth Century Fund. 1963.

Pp. xiv, 406, \$8.50

This excellent book is required reading primarily for three groups, none made up principally of economists. The appellation "required" is justified because the book is a fine survey in some depth of the basic policy issues involved in assimilating one of our newest technologies, civilian nuclear power, into an already complex, industrial society. Although new developments can make such books quickly out of date, the value of this one remains substantially intact.¹ The only development seriously affecting the analysis and recommendations made by Mr. Mullenbach was the announcement in 1964 of the so-called Oyster Creek Reactor Project in New Jersey, which the proposers claim will produce economically competitive electrical power.² Even this does not undermine his basic conclusions.

Mr. Mullenbach attempts, successfully in this reviewer's opinion, to describe and analyze what the author calls the economic policy questions which did in the past and will continue to face the federal government in the development of non-military nuclear power plants. His coverage of issues is catholic and his treatment of them is sufficiently thorough and open-minded. As indicated in the final chapter, Mr. Mullenbach does have a particular point of view to espouse and which the readers should keep in mind, *i.e.*, the federal government should take a much more active role in supporting the development of civilian nuclear power if the United States is to realize the full potential of nuclear power with reasonable speed. In spite of this predilection, the author is disarmingly objective in his

1. Although, as pointed out later, the data used by the author are a little out of date, his conclusions do not rest upon precise accuracy of economic material. *Nucleonics*, July 1964, pp. 56-72, brings the economic and technical data for power reactors up to date.

2. For a report of the public argument about the present economics of nuclear power and the validity of the claim for economic electrical power from the Oyster Creek reactor see *Nuclear Industry*, Sept. 1964, p. 18.

analysis of the problems and value judgments which face federal officials in this area. The author's description and analysis not only of the issues and value judgments themselves, but of the processes by which federal policy was arrived at, also has the ring of authority and first hand knowledge which comes from his service as an economist with the Atomic Energy Commission until the late 1950's. Actually, it is his insight into the process of policy making in this area that makes his work so attractive.

Although Mr. Mullenbach is an economist and purports throughout the book to be dealing with economic policy questions, an academic lawyer with *de minimis* training in economics but with considerable interest in the legal problems of nuclear energy feels safe in asserting that this book is not written for the economist, and in fact probably is not primarily of interest to that group. Speaking with the blithe confidence of the uninformed, the reviewer suspects that the trained economist would find nothing startling in the book. Mr. Mullenbach has not made, and in fact does not purport to make, any significant contributions to economic theory. Nevertheless, the book does make a significant contribution to a number of other groups.

The first group is limited but varied, including those with a particular interest in the subject matter of nuclear energy. Economists, administrators, and lawyers in the federal government who influence federal nuclear policy certainly should read the book. This includes those in the Atomic Energy Commission, the State Department, and the Executive Office who participate in such decisions. Every member of the Congressional Joint Committee on Atomic Energy also should read the book personally, not just have it summarized by some staff member. Presumably top management in the nuclear industry will read the book personally and with care.

Another group for which the book is of great value includes economists, lawyers, and others who are primarily interested in natural resources and the formulation of a realistic national policy concerning them. For this group, the book is not just "required" reading in the normal academic sense of one you ought to read but failure to do so will not necessarily result in flunking the course; it is imperative reading because you do flunk the course if you do not read it. This imperative recommendation is made not because this reviewer agrees with all of Mr. Mullenbach's conclusions, but because the problems he discusses are important and his analysis should

shed considerable light on what policies have been followed in the nuclear energy field at both the domestic and international level.

Perhaps the most important contribution of the book will be to a third group of persons, those interested in the processes by which the federal government reaches policy decisions on important matters involving scientific as well as economic and legal complexities. Although Mr. Mullenbach makes a very important contribution in the area of nuclear power development policy, his most important contribution is in his description and analysis of the process by which these important policy decisions were made, or perhaps in some cases fallen into, with both good and bad results. Although the book naturally has some economics and nuclear energy jargon, the author uses remarkably little, and any intelligent person should have no difficulty in reading and comprehending the problems Mr. Mullenbach is presenting. This book is about the general problem of policy formation in the federal government as to important technological developments significantly affecting the economic welfare of the country and its posture on the international scene. At least, that is the most important impact the book had on this reviewer.

In spite of this enthusiastic endorsement of the book to the groups indicated, two specific cautions should be mentioned. The first is directed to the person with considerable sophistication in the nuclear energy area. The expert who plans to read the book cover to cover, as he should, may be discouraged by Chapters I and II. Don't be tempted to stop—read on. To this reviewer, Chapter I was rather dull in two respects. There is nothing particularly new in what amounts to a summary of the problems and a statement of the questions that are presented in the nuclear energy field. In addition, although Mr. Mullenbach has a readable, straightforward style of writing, it is not spritely, and he makes no attempt to dramatize or summarize his own ideas about these matters, though he does reveal them in later chapters. The expert can skim Chapter I.

For somewhat different reasons, Chapter II, which deals with reactor technology and economic policies, might also dissuade the knowledgeable person from finishing the book. The treatment of the technology of reactors is extremely brief and canvasses only the most obvious possibilities. This is particularly true as to the potential uses for nuclear energy other than the production of electrical power. Likewise, the author's treatment of fuel reserves is extremely brief. He goes into somewhat more detail in describing the cost of electrical energy produced by a nuclear reactor, but there is

a difficulty with this material that also runs through this whole chapter and might be a serious defect in the whole book, although in the ultimate analysis it probably is not. This has to do with the timeliness of the information used by the author. Quite aside from the cut-off date of the summer of 1962 stated in the preface,³ most of the references the author makes to technology and to the economics of fuel supply and cost of electricity are to studies published in the late 1950's. Major dependence is placed upon information presented at the two Geneva conferences in 1955 and 1958. Although not a specialist in this area, the reviewer has some doubts as to the accuracy of the conclusions on these technical matters reached by the author on the basis of somewhat old data.

One also certainly could wish for a more thorough development of the economics of enriched as against natural uranium fuel economy than can possibly be included in a two-page discussion.⁴ Then, to relegate the question of the production of weapon grade material without making use of nuclear power electrical generating facilities to one page,⁵ and to do the same with the question of social costs, seems somewhat cavalier at best.⁶

In spite of these first two chapters, this reviewer is still enthusiastic about the book, and recommends it highly to the three groups mentioned at the beginning. This seems justified from the conclusion which the author reaches, and with which this reviewer agrees, that the economics and technology of nuclear power for peaceful uses are so much in the borderline area that the basic policy decisions have to be made on grounds other than pure technology or for purely economic reasons. Important questions in this area are decided by projections into the future which necessarily are uncertain. Yet nuclear power potential justifies the author's conclusion in Chapter III, that in making policy decisions in this area, we should ignore the question of whether normal sources of power such as fossil fuels and hydroelectric developments will permit the utility companies to sell electricity for lower, higher, or the same prices as now charged.⁷ Certainly within the next ten years, even with the announcement of the economically competitive reactor to be built at Oyster Creek, it is perfectly clear that it is touch and go whether nuclear energy

3. P. x.

4. Pp. 73-74.

5. P. 76.

6. Pp. 77-78.

7. P. 88.

can be economically competitive. This does not reduce the need in the mind of the author, or this reviewer, for development of nuclear power for civilian uses, although, as the author indicates, ultimately the development of nuclear energy for producing power is dependent upon how competitive it becomes.⁸ The picture is fairly clear that in the long run this will be the case, and that it is important to this country as well as to the world generally that this new source of energy be produced. The principal question concerns the speed with which the development should be carried out. This conclusion again is reached by the author on the basis of tables which for the most part are five to ten years old. But the basic conclusions which he reaches in his later discussions of the policy questions seem justified on the basis of any reasonable variations one might assume in the technical and economic premises accepted in Chapters II and III. Only the timing would be affected.

The author's most important contribution in Chapter III is bringing into sharp focus the role of privately owned electric power utilities who wanted to avoid another TVA project in the nuclear energy area,⁹ and also the role of the equipment manufacturers who are competing with each other for the very limited business available as yet.¹⁰ He makes some passing mention of the impact of the nuclear energy patent policy and the monopoly restraints found in the Atomic Energy Act of 1954,¹¹ but he really makes no contribution to an analysis of these two questions.¹² In fact, he probably is wrong as to one constitutional question.¹³ In spite of these deficiencies, this part of Chapter III is the first significant contribution by the author to an understanding of the forces that entered into formulation of United States nuclear energy policy during the last fifteen years.

Mr. Mullenbach begins his most significant contributions with Chapters IV and V, where he explores the various United States

8. P. 97.

9. Pp. 103-05.

10. P. 106.

11. 68 Stat. 919 (1954), as amended, 42 U.S.C. §§ 2011-2394 (1958).

12. P. 108; see also ch. 5.

13. The author states that "An inventor's seventeen-year right to his patent is a property right authorized by the Constitution." P. 159. He seems to be saying that the Constitution grants this right and while this has been argued by some lawyers most constitutional scholars feel that the constitutional clause is only a grant of power to Congress which it can exercise or not as it sees fit. Perhaps this is what Mr. Mullenbach meant when he used the word "authorized" but in context it seems to say the Constitution itself grants a property right.

programs and the economic policies underlying them. Even the experts should start reading carefully here. The author makes the point that the productive capacity needed for military purposes now constitutes a serious threat to the nuclear industry because we have a staggering supply of material which makes it difficult for private industry in many ways.¹⁴ He then mildly criticizes the AEC for paying incentive prices for uranium ore and plutonium.¹⁵ He follows these assertions with a conclusion that it is necessary to accelerate the development of a civilian nuclear industry *in order to support the uranium production industry!*¹⁶ This startling assumption apparently is carried over into the author's conclusion in the last chapter that the government's assistance program should be accelerated to assure rapid development of the nuclear industry. Although the statement did not seem particularly startling to Mr. Mullenbach, surely the underlying assumption should not go unchallenged. The reality of the problem for the uranium production industry is clear, as shown not only by the material in this book, but also by the President's announcement in 1964 that production of fissionable material would be significantly curtailed.¹⁷ Our capacity for producing uranium and fissionable material far exceeds any reasonable civilian (and apparently military) needs during the next decade or so. The author never makes clear, however, just why we should engage in the bootstrap operation of encouraging a growth in nuclear power so as to keep the uranium and thorium mining industry solvent.

In these two chapters the author demonstrates that the AEC's pricing policies as to ore and fissionable material in effect constituted important policy decisions affecting significantly the growth and future of the nuclear industry.¹⁸ As the author indicates, almost all of these decisions have been cloaked in secrecy so that it is very difficult to determine just what economic policy decisions are incorporated in these prices. Although there has been a government subsidy, at least in the past, it is impossible to determine the amount of the subsidy. Mr. Mullenbach's discussion of pricing policy makes a persuasive case for stripping such decisions of their cloak of secrecy, although he only hints at the need for this change.¹⁹ In the light of

14. Pp. 114-18.

15. P. 121.

16. P. 122.

17. Atomic Industrial Forum Memo, Jan. 1964, pp. 3-5.

18. He summarizes the policy questions at p. 144.

19. P. 181.

recent world developments, particularly Red China's detonation of an atomic bomb and our cutback in production, we have practically nothing to gain by maintaining secrecy, and we do lose much by way of public scrutiny of AEC decisions in this area. This is not to suggest that the decisions have been made wrongly, but only that the public has a right to know and, if necessary, to criticize. So long as these decisions are hidden in secrecy, even informed members of the public cannot offer intelligent, constructive criticism.

Chapters VI, VII, and VIII deal with United States civilian nuclear power developments as they affect other countries and, therefore, our own foreign policy. This material makes clear what most informed people have said so often, that there is very little in civilian nuclear power of any immediate consequence for the so-called developing countries, with the possible exception of India and Brazil. His summary of the addition which nuclear fuels can make to the total world energy reserves²⁰ is old stuff but useful to prove his point. He concludes, however, that Western Europe, the U.S.S.R., and Japan certainly are on the verge of needing nuclear fuel, if for no other reason than to achieve some independence from fossil fuels.

The discussion of the programs followed by the various countries which might well make use of nuclear power is brief but sufficient. His discussion of debt servicing charges²¹ and capital costs²² is a very real contribution to non-economists. A good case is made for countries such as India going to enriched fuel reactors, even though they want to be free of the need to depend upon the United States for their fuel, and, therefore, have been most interested in the natural uranium reactors. The demonstrated abundance of uranium throughout the world and the existence of competition between various reactor types and of countries who are capable of producing reactors surely should convince most of these countries that they have little to fear. Here again, the necessity of secrecy in establishing our prices undoubtedly contributes to the fear of these other countries. Such fears might not be so great if the basis upon which the prices were determined was made public.

Chapter VIII describes the general objectives of American foreign policy, past and present, and points to a frequent lack of coordination between the AEC, the Executive Office, and the State

20. Pp. 197-98.

21. P. 232.

22. Pp. 233-35.

Department, such as occurred in preparation of President Eisenhower's Atoms for Peace speech in 1953.²³ Certainly it is clear to anybody who has studied the field that the State Department has not been very enthusiastic about the main idea of Atoms for Peace, *i.e.*, establishment of the International Atomic Energy Agency. Clearly, that organization has not achieved the purpose which Eisenhower had in mind. The author nevertheless states that the greatest hope for the IAEA is that it will prevent diversion of material from peacetime operations to military uses.²⁴ To this reviewer, there is grave doubt as to the efficacy of the IAEA or our bilateral power agreements as devices for controlling the nuclear arms race. As the author himself points out, a country does not need a large power reactor program to produce fissionable material for bombs.²⁵ Although secrecy shrouds its development, one keeps seeing references to the centrifuge method of producing fissionable material. Here again, secrecy prevents the public from evaluating foreign policy decisions which may be unrealistic. If the rumors of very cheap production are true, the whole role of the IAEA in attempting to prevent diversion of fissionable material made available through that agency may become a most useless gesture. To this reviewer, at least, it seems likely that nuclear arms must be controlled by a direct approach through an international agreement, and one which must include Red China. Hopes to achieve enforcement by the IAEA or through our bilateral agreements very likely are misguided, although our foreign policy planners and Mr. Mullenbach still assume otherwise. The real problem is whether a country wants to commit its resources to the development of military weapons, and not whether the country can get some secret or some material from the established nuclear powers. Surely, additional powers besides the United States, the U.S.S.R., the United Kingdom, France, and Red China will develop a capacity for building nuclear bombs in the next ten years, if they want to. It is doubtful that the bilateral agreements limitations or the IAEA system of control will seriously affect this possibility. If that is the case, one has to ask the question of whether a great deal of trouble and time has been spent on something that basically is useless.

At the end of Chapter VIII, the author concludes that the emphasis in United States foreign policy should shift to the less de-

23. Pp. 263-69.

24. P. 282.

25. Pp. 282-83.

veloped countries,²⁶ but is this not basically incompatible with the author's earlier stated conclusions²⁷ that for nearly all cases nuclear power does not make economic sense except in Western Europe and Japan? Our foreign policy should be changed to make the IAEA what it has in effect become, an international assistance agency, not an international inspection group.

In Chapters IX and X, Mr. Mullenbach attempts to reconcile the various policies followed by the federal government in both the domestic and international areas, and he reaches the conclusion that the AEC has been too slow in developing nuclear power because it has depended too much upon the private utility and equipment manufacturing industries rather than upon a more urgent government program of research and development.²⁸ He then says that the real success of our program depends upon the development of competitive power. He concludes that there will continue to be a need for public "venture" capital in order to develop the program rapidly,²⁹ although he had pointed out earlier that there really was no immediate need for development of this power source. He makes these assertions even though he is critical of the government's pricing policies which he feels have included a subsidy.³⁰ The only objection to using prices as a method of subsidizing is that it perhaps hides the exact amount of the subsidy, but this depends entirely upon whether or not secrecy surrounds the area.

He also raises a very interesting possibility, although apparently inadvertently, when he discusses the impact of federal policy as to oil imports.³¹ He states that the usual justification of this policy is preservation of domestic supplies for purposes of national security in case of future wars. The same argument he suggests for Europe adopting nuclear power to diversify its fuel and energy sources is perhaps equally applicable to the United States. If nuclear power does provide this kind of emergency reserve, then this would seriously affect the arguments that have been made to support the oil import controls. Obviously, imports have been controlled not so much for national security reasons, but to protect the domestic oil producers. Here again is a beautiful example of the mixture and sometimes indirect impact on basic economic policies which are hid-

26. P. 295.

27. Pp. 216-27.

28. P. 316.

29. P. 326.

30. Pp. 326-34.

31. P. 336.

den in the interstices of other policy decisions purportedly based upon other grounds.

Finally, he concludes that the TVA and Bonneville authorities should get into the nuclear power field because they have shown how to produce low cost power.³² He makes this assumption without any reference whatsoever to the arguments that have been made to the contrary by private power groups.

In spite of these doubts about some of the arguments used and conclusions reached by Mr. Mullenbach, to this reviewer the total picture is one of continued need for fairly rapid development of civilian nuclear power and, undoubtedly, this will for some time demand continued government support, at least through research and development assistance. It is in the highlighting of these basic policy issues which are involved in the nuclear energy program that Mr. Mullenbach makes a real contribution.

The most significant contribution of the book, however, is as a case study of the problems which a society such as ours faces when a new technology is presented for assimilation. This study shows that assimilation does not take place automatically but rather that mistakes will be made and can be minimized only if plans are made in advance to meet the new problems which will be created by any new technology. It points up dramatically how technology and national policy become enmeshed with each other and make it difficult for government policy makers and those who scrutinize their decisions to understand the policy and value judgments involved and to reach conclusions as to which ones should be accepted. This is a wonderful case history of just such a problem. One can only hope that similar studies will be made of other technologies such as space, and soon, oceanography. Whether or not one agrees with all the conclusions drawn by the authors of such studies, it is important that serious attention be given to the assimilation problems which are inherent in all such developments.

SAMUEL D. ESTEP*

32. Pp. 340-41.

* Professor, The University of Michigan Law School, Ann Arbor.