
Book Reviews

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Collapse of an Industry: Nuclear Power and the Contradictions of U.S. Policy

by JOHN L. CAMPBELL
Ithaca, NY: Cornell University Press, 1988
pp. xiii,231

At least in North America, we are used to seeing nuclear generation of electricity promoted as a way to reduce environmentally and economically expensive dependence on fossil fuels and to increase "energy security". It is, therefore, both useful and surprising to encounter an academic study which devotes virtually no attention to these themes, focusing instead on nuclear power policy in the United States as a case study that illuminates competing perspectives on the ability of the state to promote particular technology-based industries.

After an introductory chapter which outlines the history of the US commercial nuclear energy sector, Campbell provides a succinct overview of relevant theoretical issues, focusing on potential conflict between neo-Marxists and "institutionalists". The latter term refers to political theorists who view the degree of autonomy enjoyed by

the state as considerably greater than that conceded by most neo-Marxists, and as being dependent on institutional structures within a given state rather than on broadly generalizable relations between capital and the state. The next five chapters, comprising the bulk of the book, deal with a number of specific issues in US nuclear energy policy: the lack of standardization of reactor designs; the (real and perceived) ineffectiveness of reactor safety regulation; the conflict between the federal government's promotional and regulatory objectives; financial obstacles to power reactor construction; and the failure of the federal government to find a politically satisfactory solution to the problem of reactor waste disposal. Campbell then provides a long chapter comparing nuclear power policy in France, Sweden and West Germany with that in the United States. Following this is a summary in which he argues that institutionalist and neo-Marxist perspectives on the nature of the state "operate at different levels of analysis in complementary ways" (p.194).

Campbell presents a wealth of evidence for the importance of an institutionalist perspective. He demonstrates, for instance, the impact on nuclear power costs of the legal and political obstacles to standardizing reactor design and size in the United States. He chronicles the develop-

ment of what he calls an "internal legitimation crisis" concerning reactor safety — a crisis that developed, in part at least, because of the multiple avenues of access provided by the US political system, but not (for instance) by that in France. "Corporate, political, and technocratic elites advocating nuclear power had privileged access to the most insulated and centralized interiors of the policy process" in the United States (p.78). Yet the relatively open nature of the US policy process at the level of implementation (e.g., in the case of siting and licensing hearings for individual power plants) and the public and relatively accessible nature of state utility commission decisions on electricity prices (decisions which were enhanced the ability of utilities to finance investments in nuclear power) combined to create a set of political opportunities for nuclear opponents which were (and are) unique to the United States.

The result has arguably been something approaching a de facto, unplanned moratorium on nuclear power commitments. In Sweden, by contrast, the process of policy formulation provided political opportunities that led, eventually, to the familiar referendum which called for a planned phaseout of nuclear power. Campbell concludes: "It may be that at least with respect to [nuclear power] in the West, formal democratic institutions and prolonged commercial success are fundamentally incompatible" (p.180). Although he can be faulted for not saying what he means by "democracy," he is clearly correct in arguing that the institutional framework of some "democratic" states (those in which power is highly centralized at the level of both policy formulation and policy implementation) is especially supportive of technological strategies that require the political neutralization of substantial public opposition.

This brief overview cannot do justice to the closely and carefully reasoned argument of the book. Indeed, *Collapse of an Industry* is much stronger as a study in comparative politics than as a detailed history of nuclear power policy in the United States. Surprisingly little attention is paid to the extent of corporate support for nuclear power beyond those firms (electric utilities and suppliers of turnkey nuclear power plants)

which could be expected to benefit directly from public policies supporting nuclear power. The same can be said about the rhetorical strength of appeals to "energy security". Campbell completely ignores any connection between public discussions of long-range energy strategies for "soft energy paths" in the US and the erosion of mass and elite support for nuclear power.¹ Similarly, his chapter on reactor safety omits discussion of the Nuclear Regulatory Commission's attempt (in the Rasmussen report) to provide quantitative estimates of the risk from nuclear reactor accidents. This last omission is particularly striking. The Rasmussen report's methodology and findings were strongly and effectively criticized both by the Union of Concerned Scientists and, even more tellingly, by the Commission's own Risk Assessment Review Group. Yet its estimates of the probability of catastrophic reactor accidents continue to be cited as fact by nuclear advocates.² Perhaps Campbell regards these factors as unimportant in terms of the political fortunes of the US nuclear industry, but such a conclusion should surely be explained and justified.

Although *Collapse of an Industry* does not deal with Canada, this valuable book will be of considerable interest to students of Canadian nuclear policy. At least until the mid-1970s, Canadian energy policy in general, and nuclear policy in particular, were explicitly concerned with the promotion of energy supply industries as a source of economic growth. And Canada is arguably closer to the French extreme, than to either the US or the Swedish, in terms of the distribution of political power and the limited range of opportunities for public input outside of an electoral process which provides merely formal,

1/ See, for example, over 2000 pages of hearing transcripts and associated documentation reproduced in: *Alternative Long-Range Energy Strategies*, Joint Hearing, US Senate Select Committee on Small Business and Committee on Interior and Insular Affairs, 94th Cong., 2nd Sess. (Washington, DC: US Government Printing Office, 1977).

2/ See, for example: S. Rothman and S.R. Lichter (1987) "Elite Ideology and Risk Perception in Nuclear Energy Policy," *American Political Science Review* 81:387-388.

rather than substantive, accountability. This may explain the relative imperviousness of the Canadian uranium and nuclear power industries to public opposition. There is little reason to expect rapid change in the future. On the other hand, the Canadian situation offers at least two distinctive political complications: an increasingly decentralized federal system with an associated rise of province-building economic strategies; and the availability in much of the country of an alternative option for large-scale electric generation (hydroelectric power), which is clearly competitive with nuclear power. These factors, as well as the institutional ones so ably examined by Campbell, must be considered in any analysis of the future of Canada's nuclear industry.

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Stability Within Uncertainty: Evolution of the World Oil Market

by ANTHONY E. REINSCH, KEVIN J. BROWN
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Calgary: Canadian Energy Research
Institute, 1988
pp.281

The dramatic fluctuations in oil prices of 1986 have underlined again the power of OPEC to influence the world oil market through price decreases as well as price increases. This study has its origins in the aftermath of this episode, which has come to be known as the "third oil shock". It is the work of researchers at the Canadian Energy Research Institute (CERI) and a panel of experts assembled from universities and the oil industry. Members of the panel responded to a request from the Board of Directors of CERI that they provide their views on the future path of the oil market and crude oil prices in order to help Institute sponsors in their medium and long term corporate planning and

energy policy development. An econometric model based on these views was constructed. It is a rather simple model, that does not attempt to incorporate recent developments in econometric techniques, but it has generated a rich and reasonable set of predictions. The following are examples of the interesting scenarios and arguments presented in the study.

(1) After examining a variety of projections and scenarios, the authors conclude that fundamental characteristics underlying supply and demand in the oil market will ultimately prevail. They alone appear to determine the direction and development of the world oil market. Market manipulation may succeed in the short term; in the long term only fundamentals count.

(2) A reference scenario was constructed to capture the salient features of the current world oil market. In it market clearing solutions were calculated in which OPEC was characterized as taking advantage of an imminent increase in world oil consumption and stagnant non-OPEC production. OPEC's output is assumed to increase at an annual rate of roughly 3.5%, reaching the level of 27.4 million barrels per day (Mb/d) in the year 2000. This level is 46% higher than the current level, but significantly below the current production capacity of 34 Mb/d. The price trajectory that is consistent with these market clearing levels is a slowly rising trend through the mid 1990s, followed by slightly accelerating price increases (averaging 3.7% per year) over the remaining years of the forecast period. Prices are predicted to exceed \$22.50 per barrel in 1995 and \$26.90 by the year 2000. All prices are in constant 1987 US dollars for West Texas Intermediate crude at Cushing, Oklahoma.

On a regional basis, the less developed countries and OPEC contribute the largest share of the world demand growth, with consumption increasing at an average annual rate of 2.0% and 2.5% respectively. A more modest growth rate of 0.6% per annum is expected in the OECD countries, led by the US with its rising gasoline consumption.

(3) A high resource scenario was formulated to capture the possibility of resilient non-OPEC

production in the face of declining oil prices over most of the 1980s and an upward revision of estimates of ultimate recoverable resources in these regions. With OPEC production put at the same level as the reference scenario, the increase in non-OPEC production generates a significantly lower price path. The oil price does not return to the \$22.40 level before the year 2000. This is 20% below the reference scenario price for the same period.

(4) A competitive market scenario, in which OPEC is assumed to disappear by 1989, was also considered. One is tempted to view this exercise as founded more on wishful thinking than on the consideration of probable outcomes. OPEC has outlived the forecasts of the pundits and will continue to do so as long as individual action is too costly an alternative for its members.

In the competitive scenario the current OPEC countries are assumed to return production to their previous capacity levels over the ensuing 3 to 4 years. Prices fall dramatically to \$11.00 per barrel in 1989, with a further decline to \$9.00 in 1991 and production in 1993 exceeds 33.4 Mb/d. A huge surge in demand develops in 1993 as a result of the decline in prices, which may eventually lift the price as high as the reference scenario as non-OPEC production capacity wanes.

Some of the other scenarios considered include a GOPEC scenario, that sees the four Gulf producers replacing OPEC, an OPEC Market Manipulation scenario that postulates an impatient OPEC and a series of price increases, a US Import Fee scenario, a High Centrally-Planned Economies Net Exports scenario, and finally an Alternative Economic Growth scenario. Although each of these scenarios is interesting and relevant, little analytical insight is gained from them. The most important idea contained in them is the central finding of the study that, despite the short term volatility of the world oil market and the uncertainty inherent in a market structure dominated by a heterogeneous and fractious OPEC, the market is fundamentally robust and follows a stable growth path over the long term.

While the study is based on a technical model, the discussion is generally directed towards non-

specialists. The large volume of data and the results of some of the analysis make this report worthwhile reading, though, in the light of its many assumptions and its simple econometrics, it should be read carefully and critically.

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Natural Gas: Governments and Oil Companies in the Third World

by A. DAVISON, C. HURST and R. MABRO
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The exploitation of natural gas in Third World countries presents a unique set of economic and institutional problems. These problems stem largely from the fact that, unlike oil which is easily transported and sold on international markets, gas may only be exported overseas in the form of liquefied natural gas (LNG), or indirectly through the use of gas as a feedstock in the production of methanol and fertilizers. Given the high capital costs required to produce these export commodities, and the generally pessimistic expectations for their international demand, many countries have found that the only practical strategy for making use of their gas resources is through the development of internal markets. This book provides a useful review of the issues surrounding this strategy.

The book is divided into two sections: "Issues and Policies" and "Country Studies." The issues and policies section stresses the relationships between private companies and governments in gas development. In most countries, gas exploration and production is wholly or partly conducted by international oil companies. Often, these companies' initial intention is to find oil, but when gas is discovered it is in their interest, and in the interest of the host government, to develop markets for the resource. This requires

close cooperation between the company and the government, which must take an active role by developing gas transmission infrastructure, establishing gas-using state industries and encouraging substitution of gas for other fuels, especially in the power and industrial sectors. The authors provide a clear review of the major issues that must be resolved in negotiations between companies and governments, including pricing, risk sharing, production rates and the sharing of economic rents. They point out some common problems that retard these negotiations, such as asymmetries between companies and governments in terms of technical expertise and legal power. Finally, they propose a set of guidelines for the design of contractual relationships between companies and firms, and for the establishment of an efficient set of government agencies to coordinate all aspects of gas development.

The country studies section is a set of concise case studies for eight Third World countries: Argentina, Egypt, Malaysia, Nigeria, Pakistan, Tanzania, Thailand and Tunisia. Each study is organized according to a common format, with a map showing gas production areas and pipelines, and a table containing general economic data and current figures on energy production and consumption. The countries were chosen in order to provide the broadest possible range of circumstances. For example, Pakistan was chosen as an example of a country with a long history of gas development, while Tanzania was chosen as a country in which gas production has yet to begin. Nigeria, Egypt and Tunisia provide examples of countries where gas exploitation has essentially spun off from export-oriented oil exploitation, while Argentina and Pakistan are examples of countries in which the displacement of imported oil is a principal motivation for gas development.

The country studies provide some interesting examples of how political factors complicate the relationships between governments and companies. These include Nigeria's need to balance the benefits of gas development among its regions, and the slow process of decision-making within Thailand's complex bureaucracy. Argentina provides an especially interesting example of how

pipelines prove to be "difficult political animals", as they provide disproportionate benefits to those regions they pass through, and often require complex financing schemes involving foreign companies and international agencies.

The authors take an objective and constructive approach to their topic. They resist the temptation to be overly critical of either oil companies or governments, concentrating instead on ways to develop mutually beneficial relationships between them. In this sense, the book should be of interest not only to those concerned with energy but, more generally, to anyone interested in development issues.

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