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Energy: Towards The All-Purpose Policy

Energy Policies of the World. Vol. 1: Canada, China, Arab States of the Persian Gulf, Iran. Vol. 2: Indonesia, the North Sea Countries, the Soviet Union. Edited by Gerard J. Mangone. *New York, Amsterdam: Elsevier*. Vol. 1 *1976. 387 pp. $19.50.* Vol. 2 *1977. 320 pp. $17.50.*

Oil in the Seventies: Essays on Energy Policy. Edited by Campbell Watkins and Michael Walker. *Vancouver: Fraser Institute. 1977. 283 pp. $14.95. Pb: $3.95.*

Energy Policy: Strategies for Uncertainty. By P. Lesley Cook and A. J. Surrey. *London: Martin Robertson. 1977. 240 pp. £8-50.*

Energy Technology and Global Policy: A Selection of Contributing Papers to the Conference on Energy Policies and the International System. Edited by Stephen Arthur Saltzman. *Santa Barbara, Oxford: Clio Press. 1977. 276 pp. £10.75.*

The Energy Syndrome: Comparing National Responses to the Energy Crisis. Edited by Leon N. Lindberg. *Lexington, Mass.: Heath. 1977. (Distrib. in UK by Teakfield, Farnborough.) 382 pp. £8.75.*

Rays of Hope: The Transition to a Post Petroleum World. By Denis Hayes. *New York: Norton for the Worldwatch Institute; Toronto: McLeod. 1977. 240 pp. Pb: $3.95.*

THE next time you hear someone refer to 'energy policy', ask him what he means. He may not be able to tell you. Furthermore, if you ask someone else the same question, you will almost certainly receive a different answer. Like energy itself, energy policy appears increasingly to be ubiquitous and protean, manifesting itself virtually everywhere, in an endless variety of guises. It was not, however, always thus. Indeed 'energy policy' as a concept has come into the general vocabulary only in the last five years, in the aftermath of the sudden unilateral fourfold increase in petroleum prices at the end of 1973. Since that time a major growth industry has been established - the preparation and publication of periodicals, papers and books on energy policy. Nevertheless, despite their common adherence to the use of the label, the material and the perspectives encountered in these publications range across a panorama effectively without limit. At this stage there is clearly no consensus even as to what the concept 'energy policy' embraces, much less as to what direction and form such policy might take. Six titles which have joined the list in recent months serve admirably to illustrate the disparity of views and approaches now on offer.

Energy Policies of the World, edited by Gerard J. Mangone, represents what might be called the classic approach. The two volumes thus far available include an editorial overview and eight essays by senior experts on eight geographical regions - Canada, China, the Gulf states, Venezuela and Iran (Volume 1); Indonesia, the North Sea countries and the Soviet Union (Volume 2). Each essay focuses on a region's resources of coal, petroleum, natural gas, hydroelectricity and nuclear energy; the amounts, costs and prices of these resources used and traded; the historical record of such activities, and of corporate and government decisions affecting them. Until 1973 such a discourse would have been described as dealing with 'fuel policy'. The gradual eclipse of the word 'fuel' since 1973 is one of the more curious corollaries of the rise of 'energy policy'.

Mangone and his co-authors acknowledge that the issues they discuss are now giving rise to considerable uncertainty. To appreciate the full depth of the uncertainty it is necessary to look further. *Oil in the Seventies: Essays on Energy Policy*, edited by Campbell Watkins and Michael Walker, is a compilation of eight commentaries by Canadian and American academics which, like those in Mangone et al., deal mainly with fuel policy. Contributors discuss the basis for quantification of petroleum supplies; the mechanisms by which oil prices are established internationally and within a disparate country like Canada whose supply is at one end of the country and whose main users are at the other; and the financial and regulatory interactions between different national governments, between a national government and its provincial counterparts, and between governments and energy supply industries. Only one essay in the collection, by Ernst Berndt of the University of British Columbia, deals with more fundamental questions, pointing the way into a field which not long ago was *terra incognita* but which is now attracting a growing number of explorers: energy planning and economic indices. The forecasting of energy 'demand' seemed for a time more or less straightforward, a dependent sub-category of general economic forecasting. However, since 1973 it has become increasingly apparent that the links between energy use and economic performance are much more subtle and non-linear than earlier analysts recognised.

Energy Policy: Strategies for Uncertainty, by Lesley Cook and A. J. Surrey provides a vivid and fascinating dissection of the consequences of such earlier over-simplification, as they have become manifest in the United Kingdom. Cook and Surrey begin their survey with the British government's 1967 White Paper on 'Fuel Policy'-so called-and trace the subsequent metamorphosis which has led to the 1978 Green Paper on 'Energy Policy'. They delineate the objectives of the authors of the 1967 White Paper and the criteria then applied. They then recount the consequent histories of the coal, oil, gas and electricity industries in Britain, their progressively more uneasy interdependence, and the variously strained relationships between the industries, the government and the customers. Cook and Surrey spell out with crisp pungency the pressing need for a thorough overhaul of the premises governing energy planning. Although their case study concentrates on Britain and draws all its explicit and disconcerting examples therefrom, the factors they identify arise throughout the industrialised world and pay no attention whatever to national borders. Forecasting, financial criteria, pricing policies, investment in extraction, conversion and distribution facilities, technical and design criteria, employment policy, environmental and occupational standards: all the traditional factors in energy supply policy are seen

to require urgent reappraisal, lest their inconsistencies and inadequacies aggravate an already uncomfortable tension between conflicting interests, and push present instabilities closer to the brink of seriously disruptive social and economic discontinuity. But Cook and Surrey do not leave matters at that. To cope with the problems they perceive, they put forward an array of policy proposals, based on a significant departure from tradition: the choice, first, of a long-term energy strategy, with which medium-term and short-term strategies must be consistent.

Energy Technology and Global Policy, edited by Stephen Saltzman, takes a similar long-term perspective, on a broader front. It is a collection of papers prepared for the Conference on Energy Policies and the International System, held in December 1973 at the Center for the Study of Democratic Institutions in California, under the direction of Elisabeth Mann Borgese. Six papers discuss energy technologies and scientific implications; ten consider various 'interdisciplinary and policy aspects', including energy-use modelling, energy and development, energy and the oceans, and a proposal for the establishment of an International Energy Institute. Given the fact that the papers were written before or during the 1973 oil embargo and price increase, most of them remain strikingly relevant, either because they tackle problems which are still far from solution, or because they offer solutions which are still far from application.

It should by this stage be evident that we are moving even farther away from the classical 'energy policy' exemplified by Mangone *et al*. *The Energy Syndrome*, edited by Leon Lindberg, carries us well into much less familiar terrain. The centrepiece of the book is a set of seven detailed commentaries on the energy scene in Britain, Canada, France, Hungary, India, Sweden and the United States. With the exception of the essay on Hungary (rather too complacent and abstract in tone), these essays are sharply perceptive and critical; and the criticisms are directed not only at particular decisions but at the often unstated assumptions underlying these decisions. The seven essays include quantities of numerical data and factual background, not unlike that in Mangone et al.; but the accompanying analysis takes a very different direction. The difference is drawn out in an introduction and two closing chapters by the editor. Lindberg, like Berndt in Watkins and Walker, is concerned not merely with supplying fuel energy to meet some more or less undifferentiated anticipated 'demand' - *a la* Mangone *et al*. Instead, Lindberg is attempting to find some satisfactory response to what he calls the 'energy syndrome'. 'These three characteristics (common to all the energy policies discussed in the book) - continued increases in energy consumption, public policies that focus almost exclusively on the supply side and institutional and structural obstacles to the adoption of alternative policies - make up a syndrome, that is, a group of symptoms that occur together and that describe a pathology or a system malfunction.' It is unfortunate, however, that Dr. Lindberg's prose-style is itself too frequently a syndrome - the well-known and epidemic American academese. ('By virtue of their expertise, hierarchical control, and ability to mobilise resources, interorganisational coalitions of such elites generally dominate policy outcomes and are only occasionally constrained by their political base or by the processes of pluralistic politics.') This is doubly unfortunate, because when Lindberg's analysis is comprehensible it is penetrating and provocative, and concisely pinpoints issues of major current importance.

'By and large, energy policy has only very recently emerged as a distinct area of concern in its own right .... Decisions have been taken in other spheres on the basis of criteria internal to them, and the energy consequences toted up afterwards. Neither capitalist nor communist nations have developed criteria for energy policy per se, apart from the supply imperatives of the energy production industries or the vulnerability concerns of national security. Government policies have as a consequence been short run and reactive: expand supplies to meet demand, socialize risks that the private sector is unwilling or unable to assume, nationalize or regulate to facilitate the efficient production and transmission of energy, externalize adjustment problems to other nations or to the oil import sector where possible. Energy producers - whether private corporations, multinational oil companies, nationalized coal industries, privately owned public utilities or central electricity boards - have developed natural symbiotic relationships with government officials, regulatory boards and other parts of the executive and legislative branches. They have enjoyed privileged access to policy making, directly by means of elaborate structures of co-optation and consultation and indirectly by virtue of the fact that policyrnakers have had a general propensity to identify the efforts of producers to increase supply with the national interest itself.'

The Energy Syndrome gives an uncompromising portrait of the inconsistency, inefficiency and vulnerability of contemporary supply-oriented energy policies throughout the world. (It should be noted that the incisive chapter on Britain is contributed by a group which includes A. J. Surrey, co-author of the study introduced above.) Lindberg's final chapter offers a series of principles, based on international comparisons - what might be called differential energy policy - as guidelines for future policy-making. It remains nevertheless ironic that, although his proposals lean towards the Swedish model of wide-ranging public participation and involvement, in the context of 'democratic socialism', his exegeses of the proposals are all too often couched in terminology of an opacity which will appeal only to the sort of self-selected elite he is otherwise castigating.

Rays of Hope: The Transition to a Post-Petroleum World, by Denis Hayes, is written to be read. If that means that it lacks the weight of scholarship variously displayed above, it also means that Hayes is likely to reach many more readers than will be able to cope with the burden of data in which the earlier titles here cited abound. But *Rays of Hope* is by no means merely a slight and insubstantial popularisation. Not only does it provide a valuable and comparatively accessible complement to the heavier treatises above; it also carries the concept of 'energy policy' yet farther afield, with details about energy conservation policy, energy and food, energy and the international order, and energy and social systems, presented in outline with extensive references for further information.

To recapitulate: energy policy surfaced initially in the early 1970s, as a slightly more pretentious name for what was still the old field of fuel policy. Mangone *et al*. and Watkins and Walker provide a thick dossier of useful data and background for this part of the picture; but their presentations are inescapably partial, and the policies they consider suffer accordingly. They venture a preliminary diagnosis of the problems accumulating; but they stop far short of the seat of the malaise. Lindberg *et al.* and Cook and Surrey attack the pathology with far more thoroughness, teasing out the many tangled strands of assumption and postulate which have led industrial nations to

make wildly inaccurate forecasts of energy requirements; to plunge enormous sums into ill-judged investment in energy supply facilities; to face energy price-rises which have caused severe hardship to customers both domestic and industrial; to incur staggering import bills and their consequences; and to stumble clumsily through a succession of grandiose master plans (Project Independence in the United States, *le Tout-Nucleaire* in France, and so on) which have proved comprehensively futile even in the short term. Lindberg *et al.*, Cook and Surrey, Saltzman *et al*. and Hayes all variously undertake to devise more appropriate bases for policy formulation and execution. Cook and Surrey concentrate primarily on innovative policies for the planning of supply, and thus likewise fall somewhat short of the fully integrative approach which is evidently required. Lindberg *et al*. also pursue the matter as it concerns the use of energy; but they do so as yet somewhat tentatively. Hayes offers a synoptic view of a much more comprehensive approach; but those decision makers whose attitudes will need to change are unlikely to be swayed by Hayes, if only because he is not aiming at them, nor bringing to bear the heavy artillery which alone will shift them out of their present bunker.

To the public, the visible evidence of the energy 'syndrome' has been stupefying increases in bills for electricity, gas, and oil, coupled with a rising chorus of warnings about an impending 'energy gap'. The only way to avoid this gap, it has been said, is to press ahead rapidly with the development of nuclear electricity, including plutonium-fuelled fast reactors. However, a survey of the present health of the world's nuclear industry reveals that it is in a parlous state, starving for orders, and spending its time in ferocious fraternal litigation about defaults on fuel supplies and performance guarantees. The state of affairs in the United States and France is characterised in acerbic terms by Irvin Bupp of the Harvard Business School and by Louis Puiseux of Electricite de France, respectively, in Lindberg *et al*. To suggest that only nuclear electricity can save the world from the energy gap is, as they make abundantly clear, a counsel of despair. In any case, the vulnerability of nuclear electricity to every category of disruption, from the planning stage to fuel cycle embargoes and lack of availability, to industrial action at power stations, to civil unrest, makes it a precarious replacement for unreliable petroleum imports. Furthermore, electricity, despite its versatility, cannot readily be a substitute for transport fuels, one of the major sectors now troubling policy makers.

More recently it has become clear that superficial and hasty short-term measures are likely to be impossible to implement, or to aggravate problems in other sectors. What seems to be needed instead is a much more careful study of the role played by energy, particularly fuel energy, in industrial and developing societies. The first stage of such a study is to identify and disaggregate the ways in which energy is used, particularly its end-uses: not only how many kilowatt-hours or tons of coal equivalent, but at what temperature, for what specific purpose, and with what time-variation. No customer wants energy per se: he wants motion, or chemical reaction, or a certain temperature for a certain time in a certain place. A number of the contributors to Lindberg *et al*., including Chesshire and Surrey in Britain and Lonnroth in Sweden, have been pursuing studies of such disaggregated data, as have a growing number of others in many parts of the world, within nations and also within international organisations like the UN Economic Commission for Europe and the UN Development Programme. This data-base is expanding rapidly to parallel and complement that of Mangone et al.

The next stage in the study is to recognise that a given end-use objective will require some form of energy conversion system - a house, a motor, a boiler, a furnace - plus some form of controllable fuel supply to operate it. There is now a move afoot to restore the use of the word 'fuel', which has been unwisely allowed to fall into disuse. An energy conversion system, like a house, uses fuel energy - which can be controlled, and which, at least in industrial societies, must be paid for - to adjust natural energy flows: for instance, to maintain a higher or lower indoor temperature than that outdoors. A planner starting from scratch to design a system intended to achieve a given energy-related end-use objective must consider how much should be invested in the conversion system, and how much will thereafter have to be spent on fuel to operate it. More investment in the conversion system - heavier house insulation, for example - will mean less expenditure afterwards on fuel. It then becomes a matter of choice and judgment about the optimum balance between conversion system investment and anticipated fuel cost.

Thus stated, the problem is of course oversimplified, as a number of contributors, particularly Cook and Surrey, discuss. There is already an existing infrastructure of energy conversion systems whose continuing operation remains essential: building stock, transport systems, industrial plant. It is of course possible to upgrade or replace such systems over a period of time, but the total investment entailed is very large indeed and the feasible rate of improvement is limited. On the other hand, it is now abundantly clear that designing, constructing and commissioning new energy supply facilities - mines, pipelines, power stations and so on - is likewise going to require enormous outlays of capital and very long lead-times. Clearly, both types of measure - improved end-use efficiency and additional supply - are likely to be necessary for some considerable time no matter which approach is taken. However, there is already perceptible a divergence of views as to the direction preferred and the balance sought. In general, Mangone *et al*. typify the traditionalists, who tend to assume that the task of energy policy and planning is to expand various forms of energy supply to meet a 'demand' which is just that: autonomous and insistent, not open to influence. Most of the other contributors and commentators here represented recognise, however, that policy also influences so-called 'demand': building regulations, tariff levels and structures, asymmetrical access to capital as between large investors and small investors, and so on.

Perhaps the most rapid change visible since the advent of 'energy policy' into the public arena has been the evolving perception of so-called 'energy conservation'. Initially it was construed essentially as 'doing without': turning down indoor temperatures, accepting reduced access to vehicular mobility, even losing jobs. Gradually it has since become apparent that 'energy conservation' more sensibly interpreted means the optimal use of resources - fuel, conversion systems, capital, time and human skills - to achieve end-use objectives which may not even be readily identifiable as energy-related. Seen in this light, 'energy conservation' is in no sense a noble sacrifice. It is on the contrary a highly-structured pursuit of self-interest. Consider, for instance, the driving force behind so many of the ill-conceived programmes set in motion after the 1973 oil embargo and price rises. National security, economic stability, and international financial soundness all suffered when oil supplies became unreliable. However, if a nation designs and improves its buildings, transportation and industrial processes to require smaller quantities of fuel,

it simultaneously reduces its vulnerability to subsequent disruption through the interruption of fuel supply.

As Lindberg *et al.* and Cook and Surrey make clear, there is no unambiguously advantageous set of principles which will banish the uncertainties which now hover over energy policy, whether at the international, the national, the local or even the personal level. Hayes, however, emphasises that the choices now available by no means involve merely making the best of a bad job. The upheavals of 1973 which first launched the concept of energy policy have undoubtedly caused confusion and hardship. But they also revealed opportunities hitherto unnoticed. As these six books demonstrate, energy policy is now a fertile ferment of thought and action, virtually world-wide and spilling over everywhere into further fields. What it will look like in another five years is difficult to forecast. But that, after all, is one of its many fascinations.