

NORTHERN DEVELOPMENT AND TECHNOLOGY ASSESSMENT SYSTEMS; A STUDY OF PETROLEUM DEVELOPMENT PROGRAMS IN THE MACKENZIE DELTA — BEAUFORT SEA REGION AND THE ARCTIC ISLANDS. BY ROBERT F. KEITH, DAVID M. FISCHER, COLIN E. DE'ATH, EDWARD J. FARKAS, GEORGE R. FRANCIS AND SALLY C. LERNER. *Ottawa: Information Canada, 1976 (Science Council of Canada Background Study no. 34). 10¾ x 6½ inches, 219 pages. Soft cover, \$3.75 in Canada, \$4.50 elsewhere.*

This highly readable report presents an extremely useful appraisal of the "system" for the assessment of technology relating to the programmes of petroleum development in two principal and distinct northern areas: the Mackenzie Delta and the off-shore Beaufort Sea, and the Arctic Islands or "High Arctic". The "assessment system" as the term is used in this study is the *de facto* system of participants (actors) taking decisions in assessing what is going on in technology. This study assesses the "system".

The "energy crisis" (conventionally so-designated) gives an added sense of urgency to the technology-oriented questions of exploration and transportation and the policy-oriented (or political) questions of whether the resources should be exploited and, if so, how they should be exploited, and to what degree. ("The pipeline is *not* for the benefit of the North, either in objective or in design" — p. 158). Answers to these questions have enormous implications for the peoples of the North (and for the hundreds of thousands of square miles that make up the watershed of the Mackenzie River system) that foreseeably will far, far outlast the fossil fuel reserves themselves. The issues relating to side effects or "spin-offs" are in many respects the central issues for mankind.

Hyperbole is rarely informative — and even less so in a book review. But the gas-line proposal (even though gas has not been found in threshold volume — in sufficient quantities to justify transporting it south — and oil even less so) and everything it entails adds up to an incomparable enterprise involving incomparable issues and decisions. (The nuclear energy issue is "something else"; it is peeking — peaking — around the corner and it won't go away either.)

It is not difficult to recognize the importance of the multi-party, multi-process manner in which decisions will be taken and events unfold. The action which formally

initiates the activities is the application of Canadian Arctic Gas Study Limited to the National Energy Board for a certificate of public convenience and necessity to construct a gas pipeline up the Mackenzie Valley and thence into a continental pipeline delivery system, and for an export licence. With competition from the Foothills pipeline group (Canada-only project) the adversary nature of the application is assured within the private-enterprise model of economic behaviour; and with the presence of parties of special interest adverse to the exploitation (and/or bent on putting the native land settlement question front and centre, thereby making bedfellows of the energy industry itself) the adversary nature is "guaranteed". (Canadian government funding of otherwise indigent interest groups in the preparation of their cases must also be recognized for the remarkable — unprecedented — phenomenon that it is.)

The assessment of the social, environmental and economic impact of the proposed Mackenzie Valley natural gas pipeline has been entrusted to an independent commission of enquiry (under Mr. Justice Berger). The Department of Indian and Northern Affairs has its own assessment programme. The recommendations of the National Energy Board (to the Minister of Energy, Mines and Resources) are to be reviewed by a House of Commons committee before the issue is placed before the Cabinet for decision, where the Berger commission report also will inform executive judgement as to wherein lies the public good. Global implications must also be weighed. In any event, interests are politicizing, confrontations are escalating, policies for self-reliance in many forms and for many interests are developing, and each "actor" is asking whether the North is unfolding as it should.

The report gives a good background prospective — historical and factual — on the issues relating to petroleum development programmes (Chapter II). It then presents (Chapter III) a detailed outline of the petroleum development program overall. There follows (Chapter IV) a review, masterly in detail, on regulation in the petroleum development process. The plot thickens (Chapter V) when the authors inform us of the actors (indeed, you cannot tell the players without a programme — even their numbers can be obliterated with permafrost) who collectively comprise the assessment system — the core actors, the allied supporting actors, the independent central actors, the middle range

actors, the rivals and adversaries, the exogenous rivals and adversaries, and the Arctic Island actors. Readers are cautioned that "the composition of the system is in flux". Chapter VI is a revealing — and troubling — study of information: who generates it (the question of knowledge and secrecy comes back hauntingly in Chapter VII), who has access to it, and so on. It is followed (Chapter VIII) by an analysis of fundamental decisions and clusters of decisions that have affected events in northern petroleum development, and identifies some of the big ones yet to come. The analytical framework of the chapter on information (VI) gives shape to the penultimate chapter (Chapter VIII) relating to substantive issues: technological, environmental, economic, sociological and political. The chapter deals also with issues relating to the technology assessment system itself, and identifies a disturbing recital of "overview" issues: lack of an overall policy mechanism; unresponsiveness to change; lack of co-ordinated data systems; unsatisfactory inter-actor co-ordinating mechanisms; and federal-provincial conflicts. In the concluding note (Chapter IX) the authors plead for a "larger guiding perspective" beyond technology assessment. The cautionary and sobering conclusion of the report, as stated in the introductory summary, is that "in spite of the large investment of talent, effort and money, there is no overall sense of purpose to Northern development. Instead, actors respond to situations as they arise. The absence of an overall policy about which there is some degree of consensus seems clear. The Canadian capability to undertake comprehensive and timely technology assessments, on the basis of what is learned and to innovate socially relevant development programs, is not yet established."

The report, written as of October 1974, inevitably has been dated by the passage of time. Events might be characterized by adopting (or abusing) the terms used in the report to describe the degree of centrality and relationship of the actors themselves to the development programme. (1) The "energy crisis" of 1973 was just beginning to be felt (core?). (2) The Berger commission (independent central?) was just under way in the North, and had not been to the South; the report of the staff of this commission has just been published; responses (at the time of writing this review) have yet to be given; and the contents of the report of the commission itself are not known. Nor had the enquiry been broadened to encompass forms of

northern government (see item 14 on p. 155). (3) The Canadian government actors have changed (for example the Minister of Northern Affairs, the Minister of Finance) (transient?). (4) The influence of the Committee for an Independent Canada appeared to be waxing (transitional adversary?). (5) The Arctic Institute of North America was still headquartered in Montreal (independent exogenous?). (6) Wage and price controls were still only a possibility (independent irrelevant?). (7) The qualification of the Chairman of the National Energy Board to hear the pipeline application had not been challenged (independent transitional?). (8) The Northwest Territories Council was still not fully elected nor involved in the Berger enquiry (independent central?). (9) Tapirisat and Dene had not stated their land claims (strong adversaries?). (10) The incapacity of West Coast United States refineries to handle oil from the North Slope of Alaska had not been brought home (exogenous relevant?). (11) Mr. Nixon was still in the White House (exogenous irrelevant?).

The report was written by a team of six academics in the Department of Man-Environment Studies of the University of Waterloo, Ontario. They write with authority and conviction, and present an admirable reference point and base of information and analysis for any concerned observer of northern affairs, and the "ripple effects" of resource exploitation in a sensitized world.

The report itself is number 34 in a highly respected series of background studies to Canadian policy issues relating to science and technology commissioned and published by the Science Council of Canada. It is the first of six studies bearing upon the development of the Canadian North, most of which are not scheduled for publication. It is good that this one was.

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THE POLITICAL ECONOMY OF NORTHERN DEVELOPMENT. By K. J. REA. *Ottawa: Information Canada (Science Council of Canada Background Study No. 36), 1976. 9¾ x 6¼ inches, 251 pages, illustrated. Paperback, \$4.00 in Canada; \$4.80 elsewhere.*

This painstaking study of northern development is largely historical and descriptive in nature. It starts with a definition of the "North" (defined as very large, with a southern boundary skirting Prince Rupert, Peace