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Peter Sonnenfeld

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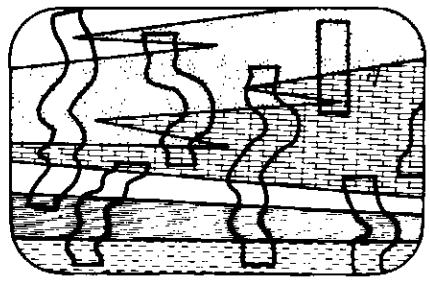

North American Energy in Perspective

Peter Sonnenfeld
Department of Geology
University of Windsor
Windsor, Ontario N9B 3P4

Hard on the heels of the 9th World Energy Conference in Detroit, organized by the Detroit Edison Company, the 16th Canadian-American Seminar convened at the University of Windsor, Windsor, Ontario, on November 14-15, 1974, with the theme "North-American Energy in Perspective". The former was mainly a conference of government delegates who devoted more than half their time to various types of pollution, to the environmental impact of technology used in energy recovery, conversion, transportation and use. In contrast, the seminar proved to be a workshop on the potential future supply and demand of energy in the North-American scene, the source of energy available, the projected demand pattern in the next decade. There were about 500 registrants and 23 panelists.

The first session was devoted to a background discussion, how we had arrived in an energy crisis and how we could get out of it. Lawrence Raicht of the U.S. State Department Office of Energy, Ms. Judy Maxwell, an economist with the C. D. Howe Research Institute and G. N. Patterson, head of aeronautical engineering at the University of Toronto and director of the Science Council Energy Study, gave their projections on the chances for developing autarchy in the energy spectrum. Canada's oil and gas production is expected to decline in the remainder of this decade. Oil and gas exports will soon have to end, electricity and coal will continue to maintain a small two-way trade. Geothermal and heliothermal plants, nuclear fission, nuclear fusion with and without lasars will not significantly displace fossil fuels and tidal power in the next decade. If the oil exporters' interests demand it, the price of oil from shale or tar sands will always be undercut. Only a high tariff barrier could insure their development and this means continued high domestic price levels.

Then followed a discussion of the feasibility of energy self-sufficiency both in Canada and in the U.S. by D. M. Fraser of the National Energy Board, Patrick McTaggart-Cowan of the Science Council and David Freeman of the Ford Foundation Energy Policy Project, Washington, D.C. The consensus seemed to be that a complete energy self-sufficiency can be achieved either in the U.S. or in Canada in time at a reasonable cost, if planned at a prudent pace. There are, of course, degrees of self-sufficiency, whether to supply all energy requirements from within the country or whether to match imports of one form of energy by exports of another. It might be more economical to trade some western oil south for eastern oil imports or for southern coal to move into eastern Canadian markets. It is, however, foreseen that western coal will start displacing U.S. coal in Ontario by 1977/78. New transport links, developed to deliver western coal to the east, will bring about economically irreversible changes in trade patterns. The overall consumption of energy could be cut drastically by a reduction in waste and by conservation: tax incentives for smaller car engines or for building insulation would be required.

Nuclear power as a major energy source was the topic of a special session. The subject was presented by E. E. Kintner of the U.S. Atomic Energy Commission, Professor David Rose of M.I.T., and A. J. Mooradian of Atomic Energy of Canada. Various nuclear reactor systems were discussed, those actually operating and those still on the drawing boards. To settle for one or the other type of reactor installation represents an enormous investment in the billions of dollars and thus is weighed most carefully against other sources of energy. However, we may not possess the required capital to build a sufficient number of plants, once we spend our money on oil imports. Down-time in nuclear reactor installations of any

design has been significant and has added fuel to public apprehension. It was pointed out that the actual accident rate has so far been minimal. For a realistic comparison, we do not only have to count casualties in coal mining accidents and cases of black lung disease, but also the crop damage and the health hazards arising from the perennial fall-out of sulphuric acid washed out of the air by rains downwind from coal-fired smoke stacks. Sampling of such environmental damage has only begun and data are still extremely scarce, in contrast to the vast data bank now available on nuclear dangers.

A possible continent-wide cooperative energy policy was hotly discussed by Carl O. Nickle, a Calgary oilman, H. R. Sharbough, Sun Oil president and Mel Hurtig, chairman of the Committee for an Independent Canada. The discussion became very lively as to whether we should develop our resources for export to make local Canadian deliveries economically feasible, or whether we should take a more nationalistic stance. The closing session then dealt with future reactor systems, with changing energy user distributions in relation to state policies and with environmental implications.

One of the highlights of the seminar was the Boland Memorial Lecture delivered by Stewart L. Udall, former U.S. Secretary of the Interior and now a declared candidate for the 1976 presidential election. Mr. Udall dealt with past decisions of government in the realm of energy supply, with consultation, judgements and misjudgements. Examples of the latter are the spectacular overestimates of oil and gas reserves, the blind belief in nuclear power as a panacea in the very near future, the underestimates of rising consumption and the total absence of a comprehensive government energy policy. He feels that we are moving out of an age of abundance for many resources and into an age of scarcity. As the cost of energy rises, so will the cost of food, since the input of mechanical energy into food production is rising very rapidly. Agricultural surpluses of the U.S. are effectively a form of exported energy and may not occur for much longer. Mr. Udall suggested that a country does not deserve to be an independent nation if it cannot feed its people; thus the first duty of the U.S. government is to assure a sufficient energy supply for its domestic food production. Further imports of energy should be curtailed and should be held at a constant figure while domestic sources are rapidly developed under the umbrella of a ceiling on imports. A twenty per cent cut in consumption would halve the U.S. import requirements in the energy field. Mr. Udall applauded Canada for trying to preserve its energy resources for its own needs and for striving to achieve a measure of self-sufficiency.

Professor J. Alex Murray of the University of Windsor has organized a most successful seminar which aired many of the less overt problems in our energy supply picture.

Few people at the Canadian-American Seminar on North-American Energy had read the just then issued two-volume collection of papers entitled *The Energy Question: An International Failure of Policy*, edited by Edward W. Erickson and Leonard Waverman (University of Toronto Press, 1974, 700 pages, $13.00 in paperback). To conserve Canadian resources, the books were printed in the United States of America.

The University of Toronto Press and the editors are to be congratulated for putting on the market a very timely discussion of the complex economic questions revolving around the world's energy supply management. 40 contributors from Canada, Great Britain and the United States of America deal in 35 papers with energy sources and markets in the world at large and then in North America in particular. They represent a variety of complementary and even at times opposing viewpoints and show that our energy problems arose from the interaction of various levels of governments in energy importing and exporting countries, industrial corporations and even sundry lobbies. The papers concentrate on the overt and not so overt economic issues involved mainly in the oil crisis as a recurring theme: bottlenecks in transportation and shortages in refining capacity, failures in longterm policies in consuming countries.

The U.S. State Department's encouragement of the Teheran agreement of 1970 to increase prices, the consolidation of OPEC solidarity under (post-Biafra) Nigerian and Libyan prodding, the failure of any accord between oil importers are seen as some of the causes of the oil crisis. An oil surplus of 1971 or even March 1973, when Kuwait had to reject all 32 bids for oil auction purchases, could not have translated itself into an oil deficiency within such a brief period. The U.S. shopping for refined products on world markets while holding up construction on about 1½ million barrels/day refinery capacity, the shift to fuel oils by electric companies unable to buy gas and an all-time high in tanker rates were contributing factors to the energy bottleneck. Several authors predict a collapse of the present price structure within the remainder of this decade, as the volatile oil tanker prices weaken again and as new fields commence production around the globe including the Middle East itself. However, a maintenance of the crude oil price around $10/barrel would allow for extended development of oil shale and tar sands plants. As governments are more and more entering the field of price fixing, the days of cheap fuel are gone. Even if Arab oil were to return to pre-crisis pricing, governments have now too much at stake in alternate costly schemes to permit such a cheap oil to enter their territory.

At higher prices it becomes economically attractive to shift production from the future to the present even at the risk of reducing ultimate recovery. Higher prices also signal a greater incentive (1) to extend existing or discover new reservoirs, (2) to improve recovery methods in order to increase the percentage of oil recovered and (3) to use existing technology of secondary and tertiary recovery to the greatest extent. Consequently, if regulatory policy does not interfere too much, supply response from conventional crude oil and natural gas sources may be substantial. Some accommodation, though, has to be found between environmental/economic/energy policies, but there seems to be no incompatibility between these questions.

Six papers deal specifically with the Canadian scene. The Borden Commission, erecting the Ottawa Valley boundary between imports and domestic production, apparently followed only the recommendations and practices of transnational companies. These found it more profitable to process in their Montreal refineries crude oils produced in their own fields overseas and imported in their own

tankers, than to rely on a mixture of crude oil from their own and other Alberta wells. Quebec aquiesced in this agreement because it enjoyed lower products prices. The guarantee of an Ontario market for Alberta crude oil was bought with the development of refinery and petrochemical capacity in Ontario. Only independent operators thereafter built refineries in the Maritimes and in Quebec, stocked with spot purchases of cheap offshore crude supplies and eying potential export markets of products.

Attention is also paid to alternate energy sources, such as coal, nuclear and hydroelectric power, but to a lesser extent. After all, both Canada and the United States are primarily fossil-fuel economies. Electrical power accounts for only one quarter of primary energy and even this is fossil-fuel energy to 65 per cent in Canada, to 75 per cent in the U.S. Nuclear power is bound to remain a subordinate energy source for the remainder of this century even if we accelerate the construction of atomic energy reactors. The various nuclear reactor systems have not yet proven to be without major breakdowns and are extremely costly to install. Coal has been allowed to become less and less important, until we now face a real bottleneck of insufficient manpower, skilled miners, to open new collieries.

The viewpoint of the contributors is mainly an economic one, bottlenecks in exploration or development technology are only touched upon marginally. It is tacitly assumed that greater economic incentives translate themselves into greater exploration activity; more drilling will result in more discoveries even in U.S. areas of high borehole density. The shortage of natural gas, the shift of power companies to fuel oil, is blamed only on reduced exploration activity based on depressed, government-controlled prices. More realistic, i.e., higher gas prices would automatically lead to the discovery of new reserves. Little allowance is made that (1) the number of economic oil field or natural gas fields is finite in any given basin, (2) some basins may thus have nearly exhausted their economic potential and (3) for other basins we might be in need or reassessing our geological concepts, in short, generate new ideas.

For someone wishing to learn something about policy disharmonies or collusions between governments or individual government agencies, between governments and industry, about the principal factors affecting short-run disequilibria and long-term outlook in our energy supply, this book is compulsory reading material.

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