

A TOUCH OF NORTHERN COMFORT

in the declining years of the fossil fuel era



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1984 will be a cold Canadian winter... without an Arctic pipeline.

Let us take an Orwellian view of the North American fossil fuel situation in the winter of 1984.

Alberta, sitting on all hell for a basement, seems to have little to worry about, though the Alberta oil industry, mainstay of at least one of our two great cities, is in serious trouble. Our Energy Conservation Board conserved enough gas for Alberta's needs for thirty years, and we have coal and wood to fall back upon. In the winter of '84 we Albertans do not concern ourselves too much that Saskatchewan has produced and sold all its oil, never had any natural gas, and has people freezing to death. It was evident as early as 1972 that Saskatchewan had passed the peak of its oil production, and was in a slow but accelerating decline. We smug and snug Albertans quote the well known parable of the wise parkland virgins and the foolish prairie virgins. Saskatchewan production in 1984 is down to a 25,000 barrels a day dribble and the 100,000 bl/day local summer consumption is being imported, at a price, from Alberta. Nobody in their right mind stays in Saskatchewan in the winter of '84. Alberta conventional crude production peaked in 1978 at 500 million barrels a year, and in the 12 years from 1972 to 1984 we ran through most of the 7 billion barrels of recoverable oil in our great reservoirs at Leduc, Redwater, Pembina, Swan Hills and Rainbow, where the oil flowed like water. This left some tarry oil along the border at Lloydminster and Cold Lake that could be prompted to flow by lighting a fire under it.

Great Canadian had invested 250 million dollars in their oil sands plant at McMurray, and though it produced 45,000 barrels of oil a day it lost money on every barrel for the first five years of its history. The plant began to break even when, in the mid 70's, the Sheiks of Araby had shrieked painfully enough to raise the price of Arabian (and therefore Albertan) crude to a representative fraction of its value. Syncrude in the mid seventies spent 500 million dollars to bring in their 100,000 barrel a day plant, and with constantly rising labour costs in the capital and labour intensive tar sand industry, also just managed to break even. Supplies of natural gas necessary for cheap hydrogenation of the McMurray oil sands were in increasingly short supply. Other major investments in the tar sands proceeded slowly and were not keeping up with the decline in conventional crude production. Oil that could be stripped from the Alberta fields by secondary and tertiary recovery methods came slowly and at very high cost. So Alberta's 1984 production was down to 1,000,000 barrels a day of conventional crude, plus 300,000 barrels of tar sand oil, and 200,000 barrels of condensate, about half the Canadian demand for nearly 3 million barrels of liquid hydrocarbons a day. Alberta's gas wells in 1984 were still yielding 4 trillion cubic feet of stinking natural gas a year, but finding rates had declined to practically nothing and all new finds were dedicated to Alberta use. Sulphur was still piling up in yellow mounds.

In the meanwhile the native land claims had not been settled for the Northwest Territories, and the Arctic gas pipeline was still a pipedream.

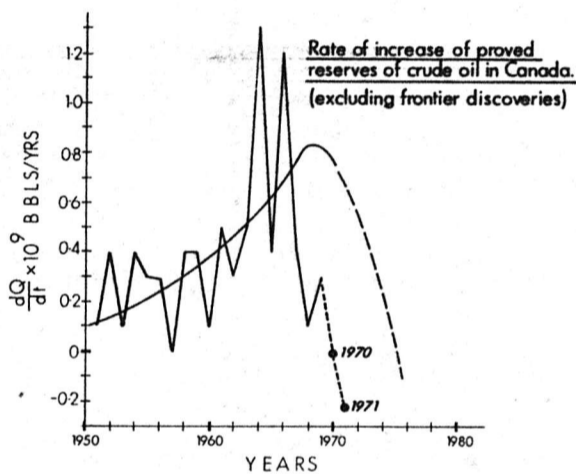
Ontario and Quebec had waited too long to build additional numbers of the little nuclear engine *Candu*, and though the existing engines were huffing and chuffing valiantly at Pickering and Douglas Point (and Gently in Quebec) they had not been able to catch up with the increased demand for electricity touched off in the first instance by Premier Lougheed of Alberta (by 1984 Prime Minister of Canada), raising the price for gas exported from Alberta in 1972.

One does not get too concerned about a deepening fossil fuel crisis when one has a summer home on the southern California coast and a winter retreat at Biscayne Bay in Florida, and the fuel supply remaining fossilized in the U.S. during the second Nixon era from 1972 to 1976. A bright little cloud of hydrogen gas appeared on the horizon, first noted by Fortune in September, 1972, in Faltenmeyer's article, "The energy joy ride is over" and in November 1972, as "The coming hydrogen economy" by Lawrence Lessing. The H2indenburg Society had bravely forecast the 1984 substitution of hydrogen produced by nuclear plants for

perpetually frozen pipeline at an initial rate of three billion cubic feet a day, presently worth a million dollars at wellhead, and worth \$5 million in Toronto, Montreal and Chicago, yielding hundreds of millions a year in royalties and taxes, committing only a handful of Eskimos and Indians to looking after it along with their trap lines, in a life little different from that of the past 10,000 years. The *direct* revenues accruing to the 40,000 residents of the NWT in royalties, and rentals will not be less than \$5000 person per year, with a bonus of cheap fuel along all pipeline points. The Calgary based oil exploration companies might shift to Inuvik as the new province of Slave throws off the Ottawa yoke. With the potential of the Beaufort and Sverdrup basins before them, the northern oil industry might well grow into a giant, dwarfing its southern parent. The initial threshold volume of 15 trillion cubic feet of natural gas is in hand, and alone justifies the Arctic gas pipeline. The potential of the basin is much greater.

The oil industry has yielded direct revenues of \$3 billion to Albertans since 1947, and proven reserves guarantee another \$3 billion in the quarter century ahead, the tail end of the fossil fuel era. There is little evidence that this industry has caused environmental

From Nuclear Energy and the Fossil Fuels, Trans. Royal Society Canada, 1970 with extension of curve based on data for past two years, R. E. FOLINSBEE



Since the halcyon days of Rainbow, when we were adding a billion barrels of oil a year to Canadian reserves through drilling in the southern part of the Western Canada basin, increased rates of production and declining discovery have led to the present

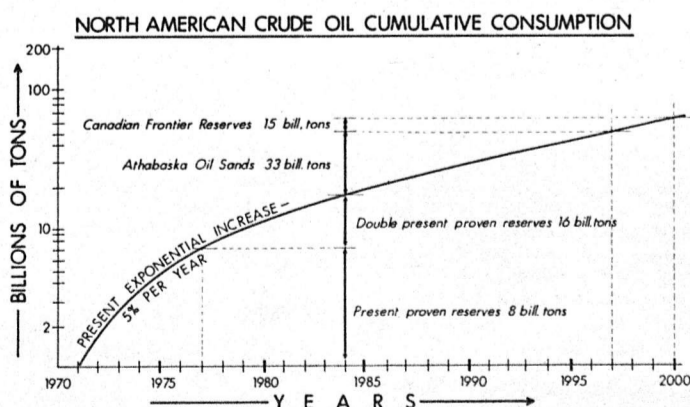
position where we are producing 5 times as much oil as we are finding; our conventional reserves will be nearly exhausted by 1984 if not supplemented by finds on the frontier.

the gasoline, kerosene and natural gas previously used to drive American cars and planes, and heat and light their homes. Faced with the alternative between generating their own power at home, and buying Arabian oil and Russian gas at \$30 billion a year (twice the value of the gold in Fort Knox), the U.S. in 1976 decided on rapid conversion to a hydrogen economy; the technology had been developed in the 60's as a spin off from the moon shots. The conversion was completed in 1984, with hydrogen filling the pipelines of that nation, in liquid form fuelling its jets and cars, and with Canada left north in the cold, with an antiquated technology. Now prepared to sell their Arctic gas, the Canadians found no takers, for the bottom had dropped out of the carbon dioxide producing fossil fuel market, just as the market for polluting coals disappeared in 1947.

The cautious Canadians kept asking, but isn't hydrogen dangerous (little remembering that in the first 100 years of the nation they had piped and used coal gas containing not only 50% hydrogen, but lethal amounts of carbon monoxide to boot, in all the cities from Gastown to St. Johns).

Orwell, the 1984 scenario I have sketched may not come to pass. Perhaps the Arctic pipeline will have been approved and emplaced to ship cold Arctic gas in a

damage - our cities have, in truth, the cleanest air in the world above them. The Leduc field still lies a mile below the wheat, and Devon is growing into a pleasant satellite town as the oil boom fades. In our view the development and production of Arctic oil and gas will be a short term interlude, generating immense short term wealth. The capital needed to develop the northern gas and oil potential is \$2 billion per year for the next decade, or 2% of Canada's Gross National Product. Comparatively, this is no greater percentage than has been invested annually in the Western Canada Basin for the past 25 years, causing the cities of Calgary and Edmonton to mushroom into power and wealth, building two great universities. The \$2 billion could be generated from Canadian capital to keep the north completely under Canadian control. It would seem desirable, however, to enlist the financial support of our potential customers, the Americans, for to shut them out would only accelerate American conversion to the hydrogen economy that will relegate our Arctic gas to the realm of a frozen asset. What is most important is that we take the capital generated from northern gas to move into thy more sophisticated and permanent hydrogen based energy system, a system that this country, isolated from the direct rays of the sun, must eventually have to continue as a habitat for any but a handful of persons.



North American reserves of petroleum are finite, and even with rapid development of the Athabasca Oil Sands and frontier fields will not long withstand the onslaught of continuing

exponential growth in consumption; a crisis in supply may occur within a decade, as the capital needed to generate new reserves or develop tar sand plants may not be forthcoming.