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DEVELOPING THE ALBERTA OIL SANDS

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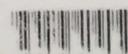
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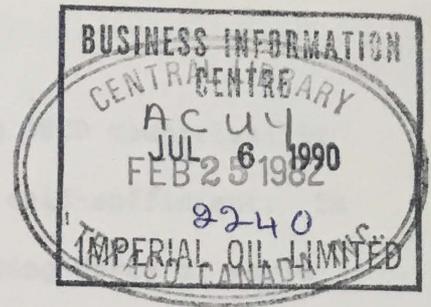
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The Politico-Economic Problems of
Developing the Alberta Oil Sands

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1. Abstract

Canada is in an enviable position. Among OECD countries, it is the only one that could be totally energy self-sufficient. In an era when energy has come to be the dominating force of world geo-politics, and the cause of a massive restructuring of the world's traditional economic patterns, Canada has the potential to isolate itself and to retreat from the insecurity of energy supply and price instability. In order to achieve this, however, difficult decisions must be made. The three controlling parties over energy policy in Canada, the federal government, the provincial governments, and the oil companies will ultimately have to work more closely in order to reach them.

Despite an inordinate amount of energy resources in the forms of coal, hydroelectricity and uranium, it is Canada's reserves of conventional and unconventional oil and their future role in fueling the Canadian economy that occupy the political spotlight. The primary purpose of this paper is to analyse and evaluate important historical aspects and present arguments surrounding the development of Canada's unconventional oil, specifically that oil which has been classified as oil sands, and how the development of this oil might serve the energy needs of Canadians in the future. However, insofar as energy and particularly the multifaceted application of oil have permeated the Canadian way of life, it will be impossible to deal with this subject without treating other, related problems.

Invariably, these related problems find their origins in the context of Canadian politics. The fragmentation, regionalization and uneven distribution of Canada's populace and natural wealth

has given the country a wide variety of strong socio-economic and political beliefs. While these may be homogenous on the provincial level, they invite frequent confrontation on the national level. The issues of resource ownership and revenue sharing from the taxation of resources have become not only inextricably linked to the issue of pricing, particularly for oil, but now have extended themselves into the broader scope of the constitutional debate.

Successful development of the oil sands depends in large part on the resolution of these conflicts. Furthermore, the oil sands present a challenge to the Canadian people to invest in their futures in an orderly way, such that it will hopefully become the prototype of natural resource development for Canadians in the future.

2. Introduction

The politico-economic problems facing the development of the Alberta oil sands are formidable. Before proceeding, a few assumptions, notes and simplifications, which in no way will distort the analysis, should first be made.

The Province of Alberta is by far the largest producer of oil in Canada, supplying 84% of total domestic production. It is furthermore blessed by having within its borders all the identified commercially developable deposits of bituminous sands. The provinces of British Columbia and Saskatchewan will be ignored as they are insignificant forces in Canadian oil policy-making. We will examine Alberta exclusively in the federal-provincial energy negotiations, and we can safely assume that the province has a unique and monopolizing hold on Canada's present oil producing ability and most of its potential.

To deal with the regulation of the energy industry in the province, the Alberta Government established the Energy Resources Conservation Board. The Board's purpose is to ensure both that Albertans derive maxima economic benefits from development of the province's resources, and at the same time that this development is conducted in a safe, orderly and equitable manner by and among industry members. Other Board responsibilities include maintaining records of resource development and occasionally publishing data for public information. The AERCB was modelled explicitly after the Texas Railway Commission, with the intent that the Texan experience of rapid resource depletion and gross resource mismanagement in the earlier part of this century would not be repeated in Alberta.

The federal counterpart to the AERCB is the National Energy Board (NEB). While the NEB does not have actual legislative authority, it has assumed the role of policy initiator, usually submitting proposals to the Department of Energy, Mines and Resources (EMR), where they are scrutinized and perhaps passed on to the ministerial level.

In order not to confuse the reader, commercial oil sand projects will be identified by their most recent corporate names. For example, Great Canadian Oil Sands Ltd. evolved into Suncor Inc., but for the purposes of simplification the name Suncor will be used. Similarly, though Shell Canada Ltd. proposed a commercial oil sands project early in the 1960's without a name, the project has been revived and has been christened Alsands. Shell has also taken on consortium partners which it did not have during the time of the first proposal. In charting the history and development of this project, Alsands will be the name used.

Because an exhaustive history of the development of the oil and gas industry in Canada is not possible within the bounds prescribed by reasonability, this paper will limit itself most exclusively to a discussion surrounding the recent political and economic events that pertain to the development of the tar sands. In particular, this will involve an account and analysis of the post 1979 federal election events up until the recent past.

3. Energy Self-Sufficiency

Energy crisis. This helplessly overworked phrase has found its way into the everyday vocabulary of the modern world. Yet apparently not so in Canada.

The rise of the OPEC cartel in 1973-1974 startled the world. (It scarcely requires further historical explanation.) The effect of this rise was an international outpouring of rage from industrially developed nations, and a feeling of thankfulness from lesser developed nations who saw in the cartel a model by which they could wrest control of their own natural resources from foreign controlled multinational corporations and plan their own destinies. In Canada, an anomalous case among industrialized countries, the reaction was more subdued. By virtue of being one of the largest nations on the planet, Canada is a country blessed with seemingly endless and undeveloped natural resources, hydrocarbons included. In addition, it has an industrialized economic base. So paradoxically, Canada was on the one hand a developed country being exploited by others, and on the other, an underdeveloped country able to exploit itself.

Canada has been and continues to be energy self-sufficient, in the sense that its energy trade balance is positive, that is, it exports more energy than it imports. In 1978 ten times more electricity was exported than was imported, representing 6.4% of total generation. For coal, the import and export statistics indicate a slight deficit (508,000 short tons, or 1.5% of total Canadian production), which can be considered insignificant [1]. As for natural gas, there is so much excess capacity in Western Canada for want of additional export markets, that it has become

a hotly contested political issue.

The aggregates, however, mask a seriously deficient and still deteriorating supply position in crude [2].

4. Oil Self-Sufficiency

Self-sufficiency in oil eludes Canada. Why? To understand this problem, a more detailed examination of the history of Canadian oil policy is necessary.

History.

As was the case for much of the industrialized world, Canada based a good deal of its postwar economic growth on the cheap availability and flexible application of oil. Oil was used to fuel electric generation plants, heat homes, etc. Due to its climate and geography, however, Canada came to depend even more so than most industrialized countries on a steady and growing supply of energy; it now has one of the highest per capita consumption rates of energy in the world. More than most other countries, too, this represents a disproportionately high percent of consumption. Compared to hydro, natural gas, coal and nuclear energy, which measure 26%, 19%, 7.5% and 1.5% respectively, petroleum constitutes 46% of Canada's total primary energy needs [3].

Owing to its vast geographical expanse, the ways in which Canada decided to efficiently allocate its energy resources in the past dictated the evolution of the predicament the country now finds itself in. Since the provinces of Ontario and Quebec are the most populous (together accounting for 62.5% of total Canadian population), and therefore possess the industrial base of Canada, it is here that the most consumption takes place. Oil production, on the other hand, originates at the other end of the country. During the Diefenbaker Government, when it was more

costly to transport oil from the western part of Canada to the East than it was to import oil from Venezuela or the Middle East (much the same as it was in the U.S.), the Ottawa Line agreement, as a part of the National Oil Policy of 1961, came into being. It stipulated that the region east of the Ottawa Valley Line would be supplied with imported crude oil, and Albertan oil would supply all regions to the west of the Line. The problem for Albertan oil producers, then, was not one of finding supplies, but rather one of finding markets, as it could not effectively compete with Texan crude elsewhere on the continent. Production was therefore shut-in, and exports remained minimal.

When toward the end of the 1960's the price of OPEC oil increased, Albertan oil became competitive and production was rapidly expanded. On the eve of the OPEC embargo, Canada was exporting more of its oil production than ever, 73.9% to be exact, a somewhat staggering figure. By the same token, imports peaked at 964,800 bbl./day, or 31.5% of demand.

The "crisis" caused Canadians to reassess their energy situation, and the federal government called for total energy self-sufficiency by the end of the decade. With the exception of heavy oil, export restrictions were imposed, and production was directed towards serving domestic markets alone. (Exports declined abruptly, representing 31.3% of production as of 1978.) Yet, because the necessary infrastructure was lacking (i.e. there was no Toronto-Montreal pipeline then), Albertan oil could not immediately penetrate east of the Ottawa Valley Line, and a good portion of the East remains dependent on imported oil to this date. In the words of EMR, the Ministry of Energy, Mines and

Resources, "Oil exports have been reduced and considerable domestic productive capacity has been temporarily "shut-in" to be available for domestic markets in future years. Some exports have been allowed on a "swap" or exchange basis to obtain supplies in Eastern Canada during periods of international shortage, such as during the Iranian revolution [4]." By 1976, however, Canada had reversed its position from net exporter of oil to net importer. Ironically, Canada had exported most of its crude oil at a time when it was most capable of being self-sufficient. From a high rate of 118.8% self-sufficiency in oil in 1973, Canada now hovers around the 80% mark [5]. Nevertheless, it should be emphasized that before 1974, the flows into and out of the country were such that the economic benefits were maximised, and few could have predicted and accurately avoided the impending world price escalation.

Present Disposition of Crude.

Crucial to the debate for self-sufficiency in the supply of oil for Canada are the reserves of oil. These reserves, in turn, only take on significance when measured against two other variables: production of and demand for oil. The reserves-to-production or R/P ratio is a life index for the reserves, indicating the amount of time remaining before the reserves will be depleted at current rates of production.

For five consecutive years the ratio has been declining; increases in production offset increases in reserves, causing net deficits year after year. "The Northern Miner," a Canadian publication on natural resources, recently estimated the R/P ratio at less than 13 years. A more authoritative source, the AERCB, cal-

culated it at 11 years. The NEB had an even more pessimistic projection with a ratio of 9.9. Conventional oil reserves declined from 5.48 billion barrels in 1976 to 4.78 billion barrels in 1979. Production of conventional crude rose to 1.3 million barrels per day from 1.15 million bbl/d, an increase of 11%. (Production of synthetic crude, about which more will follow, increased from 56,000 bbl/d to 91,000 bbl/d [6].) The trend is alarming, the rate even more so.

There is considerable likelihood that a major oil strike, such as the last at West Pembina in the mid seventies, will not occur again in the conventional basins of Alberta. There is little reason, therefore, to believe that the R/P ratio could be raised from the prospects offered by conventional oil.

The story about Canadian imports is even more disturbing. By 1978, imported oil came primarily from four OPEC sources: Iran, Iraq, Saudi Arabia and Venezuela. Respectively these countries provided for 17.9%, 3.9%, 21.6% and 33.9% of Canada's import requirements. In 1979, 97% of the oil came from OPEC countries, although the share from the Persian Gulf had been diminished somewhat to 38%; The price averaged \$35.00 per barrel [7].

The demand forecasts, furthermore, are not very encouraging. Conservation and substitution, two factors affecting the rate of growth in consumption, will be dealt with in the next section [8].

Definition of Problems.

The most obvious implication is that Canada has little more than a decade to find and replace the oil that it still has. If

indeed self-sufficiency is a desirable goal, the time limit imposed by the R/P ratio should already be pressing. For those who question the concept of self-sufficiency, further scrutiny of the alternative, more imported oil, is necessary.

Imports as an Alternative.

The Canada West Foundation, an organization associated with western Canadian interests and a strong advocate of self-sufficiency, published a report in 1977 entitled "Canada's Resources and the National Interest." Not even they recommended full scale self-sufficiency, but did have this to say:

"Failure to recapture a reasonable degree of self-reliance in oil and gas would condemn Canada to a permanent state of dependence on imported oil. Such a position would jeopardize our security, all the more so since the price and supply of oil are largely determined in some of the more volatile parts of the world. Individually or jointly, these implications are not compatible with the economic health or sovereignty of Canada [9]."

These are arguments for self-reliance, a term which was used to describe a policy by which Canada could be able to sustain itself in a dire situation. Normally, however, the prohibitive costs of developing additional supplies such as the tar sands did not warrant displacing imports, i.e. the economics of imported oil still looked more attractive over the short term than the economics of developing the tar sands. Self-reliance was a policy proposed and pursued in 1976, largely before the more tumultuous political outbreaks in the Middle East had occurred. Since then, the animosities aroused in Iran by the Canadian ambassador Ken Taylor, who helped six Americans escape from Iran during the time that country was holding American hostages, are sufficient to preclude any thought of Iran further supplying Canada with imported oil for a

very long time.

An economist from Shell Canada, P. Pokrupa, evidently somewhat ignorant of the sovereignty and dependence argument, analysed the situation this way, also in 1977:

"The problem isn't the cost of the post-1985 imports so much as whether Canada can get those imports, considering that by 1990 a worldwide supply/demand crunch is expected. It is the period between 1985 and 2000 which is the critical one. In this period the availability of domestic oil will decline sharply because of the natural depletion of existing reserves, while the continuing growth in demand for oil will not be arrested. It is, therefore, the period after 1985 to which government energy policy should be directed and specific strategies developed [10]."

Long term security of supply is paramount in Pokrupa's mind, but implicit in his statement is the element of cost. The outbreak of civil war in Iran and the Iran-Iraq war together have provided ample evidence that security of supply and cost of supply are more closely tied to one another than Pokrupa would have us believe. Japan, for instance, the most heavily dependent industrialized country in the world for oil, has been able to maintain its supply since the embargo, but only at a price. Japan's oil needs have cost the country dearly, as it has found itself having to pay top dollar for relatively short term oil contract prices, and also having to pay in the more expensive spot market for oil to compensate for the shortfall.

In order to reduce the impact of the high cost of imported oil, the federal government adopted in 1974 a policy of subsidizing imports, which are and continue to grow more expensive than domestic oil. The price for Canada's oil imports in 1979 averaged \$35.00 per barrel; on a per capita basis, the oil-import

subsidy during the four years until 1977 amounted to about \$500 for each man, woman and child in Canada [11]. By now, this figure could easily be trebled, if not quadrupled.

These are the direct arguments that speak against further imports of oil; lack of immediate and future security of oil supply, inflated cost of imported oil, and continued dependence on other countries leading to loss of political and economic sovereignty. One could argue that imports allow diversification of supply; during the pre 1973-1974 era, this was a legitimate defense for imports. The foundations for this argument, however, have been eroded by the political instability dominant in the Middle East, still a source of Canada's imported supplies of oil, as well as by the escalation of the real price of oil.

Indirect Implications of Imports.

The economist, however, will demonstrate that the cost of imported oil is the decisive factor (and not the security of imported oil supply), from the international macroeconomic as well as the national macroeconomic point of view. Assuming that OPEC oil poses a problem of security, and non-OPEC oil does not, one could ascertain that the former is disadvantaged with respect to the latter in the marketplace. This is, in fact, true, as Britain, Mexico and China have all priced their oil at a premium to OPEC oil. But considering that non-OPEC output is relatively quite small, this price differential can only reduce and not significantly alter the premise of the arguments about to follow.

Balance of Payments.

For every dollar that must be paid for imported oil, a dollar must be earned from exports. If total exports exceed total imports, a net increase in wealth will flow into the country. If total imports exceed exports, then there will be an outflow of wealth from the country. If the dollar values of imports equal exports, then the country will have benefited from the availability of foreign, perhaps different, goods and services without incurring a cost.

The implied optimal situation of this most basic of economic laws is to achieve a trade balance which is equal to or greater than zero. The wealth of the OPEC nations can be explained by this fundamental principle.

For Canada, footing the oil bill since 1974 has become a staggering burden. The total current account balance in the balance of payments at the end of 1973 stood at \$18 million [12]. By 1978, this had turned into a deficit of \$5.29 billion. It is once again not only the trend, but also the rate to which I would bring attention.

This deficit in no small part can be attributed to the continued dependence of Canada on imported oil at constantly rising prices. The most critical elements of the balance of payments account are the values for merchandise exports and merchandise imports; here the figures for energy exports and oil imports for Canada are reflected. In 1973, when Canada was still exporting oil, and importing cheaper oil, the merchandise balance stood at \$2.7 billion. This narrowed the following year, turning into a

slight deficit of \$500 million in 1975. Although Canada reduced oil export commitments after 1974, it reversed its deficit in the merchandise account again in 1976 by increasing exports of other raw materials, in order to make up for a growing deficit in the services account. Nevertheless, a good indication of the severe impact rising international oil prices have had on the trade balance can be seen from one 1975 estimate, which calculated that Canada's oil trade deficit would be \$4.5 billion annually by 1985 [13] being eclipsed by present estimates, which calculate these deficits in the range of \$10-15 billion by 1985 [14]. The net annual cost, in fact, of the federal government's oil import subsidy program in 1980 already stood at \$3.7 billion [15].

It is not important, as such, what the actual figures for payments of imported oil are. What is important is what role they could play in the improvement of Canada's balance of payments. The net monetary movements deficit for 1978 was \$3.3 billion; considering an estimated annual \$2 billion cost then for imported oil, the effect an absence of imported oil could have had on the balance would have been substantial. Furthermore, Canada would not have felt the need to export other raw materials, but rather could have conserved them for value-added processing in Canada itself.

There is one other basic economic principle that must be applied to the balance of trade argument. Each dollar that is exported for payments of imported goods and services is gone. It quite literally disappears from the Canadian economy. Each dollar that is imported or retained, on the other hand, is regenerated time and time again. Economically stated, net deficits in the

balance of payments incur large opportunity costs as they deprive the domestic economy of a multiplier effect. (Specifically, as will be seen a bit later, this opportunity cost with respect to oil must not be carried so much by the federal or provincial governments as much as it will have to be borne by the industry.)

When we take into account that GNP in 1978 was \$239.7 billion (current dollars), and a reduced (and therefore more conservative) estimate of the annual oil import bill was \$2 billion in 1978, one might deduce that the federal energy policy of maintaining imports had a net negative effect of about 1% growth in the economy. While such reasoning is admittedly simple, it is not without reason, and could warrant further investigation. In the end, the point should be plain and simple: imports have a strong negative effect on the balance of payments, and the costs involved are many times the absolute value.

Government Spending.

As the rate of international prices rises faster than the rate of increase of domestic price for oil, the federal government (henceforth synonymous with Ottawa) increasingly finds it necessary to plunge into the public purse for additional funds. In effect, then, the Canadian taxpayer subsidizes imported oil.

With a commitment to subsidizing imported oil, and with a lack of funds by which to finance the costs, the federal government found no alternative but to incur larger than anticipated deficits. This is particularly true for 1980:

"With the domestic oil price set at \$14.75 a barrel, taxpayers will have to shell out more than \$25 a barrel to make up the difference on the roughly 450,000 barrels of crude Canada imports into Quebec and the Atlantic Provinces each day. These increases have added about \$500 million to the estimates total for Canada's subsidies. Unless the federal Government is successful in its search to find new ways of trimming it (the oil import bill)...Ottawa will have to borrow even more than the target Finance Minister Allan MacEachen set in April [16]."

Of late, the word "deficit" has taken on a negative connotation due to the prevailing mood of conservatism. Although there have been several examples of deficit spending, which can, in fact, be the proper solution to macroeconomic problems, fundamental Keynesian economics dictates that deficit spending is beneficial if and only if the government creates demand that otherwise would not have occurred. By borrowing more money, and thereby crowding out private investment, and furthermore spending those monies on an existing demand (rather than generating additional demand), which for all intents and purposes had a multiplier of zero, one is tempted to say that the federal government threw away a lot of money that could otherwise have been used more productively. I am not trying to imply that the government's subsidization program caused the federal treasury to go into the red. More plausibly, I am suggesting that it didn't stop it from going in deeper.

A relationship between the federal pricing policy of oil, the balance of payments, and federal spending should now be emerging. More specifically, the problems outlined above could have been at least tempered if the difference between the domestic and the world price for oil had not been as large as it was in 1974 -- and as it kept growing. While I have not supplied any quanti-

tative evidence to validate my conclusions, I believe that the arguments presented here are nonetheless logically correct.

Dollar Value.

More than most industrialized countries, Canada depends on foreign investment to spur its economic growth. Admitted openly by Bank of Canada officials, one of the prime reasons for the seemingly constant margin between Canadian and U.S. interest rates is the need to attract investment capital to Canada. With its vast natural resources waiting to be developed, and a small population from which it can only raise a limited amount of capital to do so, Canada must constantly encourage foreign capital markets to fill in the gap.

A good indication of investor confidence in the Canadian economy is reflected in the exchange rate. As demand for the dollar goes up, so too does its price. As investor confidence wanes, demand declines, and the value of the dollar on the exchange along with it. It is interesting to note that up until 1977, the Canadian dollar stood at par with, if not one or two cents above the American dollar; it was at about this time that Canadian oil production peaked, and exports still exceeded imports. The approximate year's delay between the exchange rate market reaction and the actual changeover from net exporter to net importer can be explained by the release of the data, i.e. the indication that Canada's trend towards dependence on imported oil was not as pronounced as the exchange market expected was due to the delay in collecting and releasing the annual figures. Nevertheless, as it became obvious that Canada was putting itself into the humiliating position of becoming a net importer, despite the fact that it

had substantial petroleum resources, foreign investment registered its skepticism about Canada being able to maintain its economy in order. The dollar declined sharply for a sustained period of time.

Investor confidence is not measured so much by what is actually happening as by what is perceived as happening by the investor. Although I am not trying to suggest a direct correlation between Canada's oil trade balance, higher government deficits and value of the Canadian dollar as measured by foreign investor confidence, an indirect relationship is quite probable. Greater statistical evidence and analysis would be required; suffice it to say here that the Canadian dollar remains pitted, ceaselessly stooping to greater lows; meanwhile the outlook for Canada's balance of payments does not appear any more promising, nor do the prospects for reduced levels of imported oil.

An additional point should be made about the dollar. As the value of the Canadian dollar declines relative to the American dollar, the cost of imported oil to Canadians increases. Because imports are paid for in American dollars, it is in Canada's best interests to maintain the value of its dollar. Supporting the dollar has its costs as well, however. When the exchange markets deserted the dollar, and it was apparent that its value was fast approaching the psychological value of U.S.\$80,

"the federal government borrowed \$900 million (U.S.) from Canadian and foreign banks during December (1980) to help finance a major effort to prop up the Canadian dollar. Defending the currency with borrowed U.S. dollars was a costly operation. The Government did not announce what interest rates were paid. But the terms of the standby lines of credit indicate the money probably cost in the area of 20% [17]."

What is even more intriguing about this incident is its timing. The dollar began its slide in December. Deak Canada, in its monthly circular called "Money Matters," described the state of the Canadian dollar in mid-October as still "quite strong because of our enviable energy position." The National Energy Program, a comprehensive energy policy package introduced as an integral part of the new government's budget, was presented on October 28, 1980. Foreign investor disappointment in the National Energy Program was clearly manifested in the slide of the dollar in December, a month after which all the Program's implications had been determined and publicized.

There is occasional talk in financial circles that the Canadian dollar will stage a comeback. Some, dreamy-eyed, talk of a petro-dollar. Indeed, such talk is not entirely without reason. The potential is still there to become oil self-sufficient. But the means and ways to achieve it are fading away.

Macroeconomic Considerations.

Imported oil threatens the macroeconomic fortitude of Canada. The problem, as well as the solution, lies in the price of domestic oil. Were the difference not as great as it is between domestic and international prices, the oil import subsidy would be considerably lower, as would the government and the trade deficit, and the perceived performance of the Canadian economy by foreign investors would be closer to optimal, which would result in a stronger dollar.

It should also be noted that subsidization of high cost imported oil has the double-barrelled effect of deferring the real

cost of oil, as well as discouraging conservation. This will be discussed in greater detail below.

Oil imports, to conclude, are not a viable or acceptable alternative. By all considerations, both direct and indirect, imports pose a multitude of highly undesirable, but avoidable, quandaries. It is the intent of this paper to demonstrate that imports can be eliminated in a rational and economically responsible manner, and that by so doing, Canada might eventually isolate itself from the profoundly disturbing effects of imported oil.

5. Alternatives

There is much hope that the the successful discovery and development of commercially sized deposits of "frontier" oil (oil that is located at the fringes of Canada's borders) might reduce and eliminate imports, and might therefore solve Canada's impending imbalance of oil supply with respect to demand. The two most promising areas now being scrutinized are the Beaufort Sea in the Arctic, and the offshore region east of Newfoundland, now more commonly known as the Hibernia formation. Conservation, much bal-lyhooded and the subject of considerable political debate, will not significantly narrow the supply/demand gap, but only delay it. The same is true of substitution.

Arctic Oil.

A region with a high potential for future production of hydrocarbons in Canada is the Arctic. Two companies in particular, Dome Petroleum and Panarctic Oil, have recently made several strikes in the Beaufort Sea area. Assuming that development of the field will take place, there are significant environmental hazards and logistical problems that must be overcome. The dangers of deep sea production in the vicinity of the Arctic Circle present environmental difficulties given the possibility of ruptured underwater pipelines due to ice movement. As yet, the necessary technology for solving this problem has not been developed. It will be several years before secure and uninterrupted deliverability of oil without environmental mishaps can be assured. In addition, the lack of an existing transportation infrastructure presents the difficulty of bringing Arctic oil to market.

Whether transportation of the oil is achieved by by pipeline, or by icebreaker-assisted tankers, the costs involved are tremendous, presently estimated at \$20,000 [18] per daily barrel of production capacity. All this aside, it will be several more years before exploratory drilling will show 1) the geological perimeters of the field, 2) the lifetime production capacity of the field, and finally 3) the commerciability of the area itself.

Hibernia Oil.

The Hibernia discovery off the east coast of Newfoundland has generated a considerable amount of stock market excitement [19]. Estimated to contain close to a billion barrels of oil, it has the potential to relieve the eastern part of Canada from the insecurity of imported oil. It will, however, but marginally protect eastern consumers from the higher cost of imported oil; as with the Beaufort case, Hibernia's situation is also somewhat unique, as new technologies are being called for. The Hibernia field involves the deepest offshore drilling ever conducted. Because of this and the constant danger of icebergs, estimates of the capital costs of developing this field are at least three times greater than those for the development of a conventional well. Conflict over the ownership of offshore as well as onshore resources, involving the federal government and the government of Newfoundland, further compounds the problem by threatening to delay development and production, if not altogether prevent it. Under optimal proceedings, Hibernia oil would not reach the market for at least five years [20]. Premier Brian Peckford, who considers the Hibernia field an opportunity for the people of Newfoundland to alter significantly their position as the most

economically dependent of all ten provinces on the federal government, intends to obstruct the necessary arrangements oil companies will have to make to produce the oil, unless the federal government cedes control and transfers ownership of the resources to the province. Peckford's stand is firm: "On ownership there is no place for bargaining [21]." Mr. Peckford apparently continues to pursue his objective with such persistence that he is able to provoke Trudeau into swearing [22]. Without the necessary distribution infrastructure located in Newfoundland, production from the Hibernia field will not be possible.

Conservation & Substitution.

As alternatives to imported oil, conservation and substitution are better discussed in terms of projected demand for oil. It should come as little surprise that the demand for oil, in turn, is a function of its price. Substitution of natural gas, electricity, coal, and biomass for oil as a primary energy input are also functions of the relative prices of these commodities on an equivalent BTU basis. Therefore, this discussion on conservation and substitution will focus primarily on their relationship with the price of oil.

Since a discussion of oil substitution and conservation would be very involved, and should include many more aspects of the total Canadian energy picture than can be dealt with here, I will attempt to summarize the findings of the most recent report from the Ministry of Energy, Mines and Resources [23].

Of primary energy demand in 1978, oil accounted for 44.0%. EMR's projections for the year 2000 indicate that, while this

share is expected to decline to 30.9% of demand due mostly to increased substitution, the absolute increase in energy demand overall will still call for an annual absolute increase in demand of roughly 6% for oil.

The National Energy Board has calculated that the major swings in consumption on which their demand projections were based displayed an oil price elasticity on the order of $-.1$ to $-.2$. Now the only remaining problem is to define a price which maximises the conservation and substitution ethic (minimises waste), and at the same time maximises the productive use of oil.

Perhaps the only positive remark that can be made about international oil in general is with respect to its price; the OPEC cartel adjusts both prices and production so that they will accurately reflect not only what OPEC considers the user cost of oil to be, but also what it considers the replacement cost of the oil to be. OPEC raises prices and raises and or lowers production at a rate which is consistent with the OPEC members' belief that the revenues derived from production will ensure that their economies will be self-sustaining after their reserves have run dry. The benchmark OPEC price is thus an accurate one that takes into account the global supply, demand and (because oil is a non-renewable resource) future value of its use. Notwithstanding the short to medium term implications of contract prices, the same is even more true of the spot market price.

With these things in mind, we can now take a look at the conservation situation in Canada. Prices for conventional crude production are presently at Can\$16.75 per barrel. The going international price of a comparable quality crude is at

Can.\$41.00 mark. To put it differently, the Canadian wellhead price for crude is 40% of the international price. The implications should be blatantly obvious: "A recent study by the Paris-based International Energy Agency revealed that countries which keep their oil and gas prices below world levels have the worst track record in energy conservation [24]." Canada has the privilege of belonging to this group.

The most dramatic substitution effect in Canada is expected to take place with natural gas. A word should be said about this too. To encourage substitution, the federal government has adopted the policy of pricing natural gas at about a 15% discount on an equivalent BTU basis compared to oil [25]. If, however, the price of oil is not indicative of both the user and the replacement cost in the first place, as it is on the world market, then it could be said that the federal government was meeting its objective of substitution at the expense of conservation, of both oil and natural gas.

Given the above price elasticities, if Canada were to raise the price of oil (which automatically raises the price of natural gas as well) the cause of conservation would benefit. As long as government mandates a price that is less than half of what can be considered a true market price, and at the same time proclaims a policy aimed at conservation, it will expose itself as hypocritical. The outlook for conservation in Canada remains dim. As one of the highest per capita users of energy in the world with one of the poorest rates of conservation, demand forecasts for oil and other fuels will continue to be unabashedly high.

Summary

Though there are legitimate alternatives to Canada's looming energy supply problem, they do not present themselves as optimal solutions. Each has its inherent disadvantages and or shortcomings. For frontier oil in particular, "political factors and technique factors will have an effect on the cost of exploration, development, production, and environmental protection. The net result will be extraordinarily high-cost operations. Prices will have to be high enough to pay that cost and still return a substantial profit" commensurate with the risk [26]. Not even if taken in conjunction with one another can these alternatives equal the shortfall in domestic production over the next decade; "even assuming a vastly stepped up effort in exploration and development-an effort which has so far failed to take place- oil from these new frontier resources is not likely to supply more than 25% of our domestic consumption much before 1990 [27]." The word for conservation and substitution is already sufficiently out.

It cannot be sufficiently emphasized that it is in Canada's best economic interests to pursue development of frontier reserves as if they could indeed provide the necessary solution, for in order to achieve self-sufficiency, wide diversification of energy sources is preferable, (even when produced domestically), to reliance on a single or smaller number of new sources.

6. Oil Sands

The fourth, and as yet unmentioned alternative to the future shortfall of conventional oil production in Canada rests in the oil sands of Alberta. The oil sands, or tar sands, as they are also known, are, however, a bit more than an alternative; they should be considered the large part of the solution.

A more common description of the tar sands would include such words as "gooey" or "molasses-like". To restrict one's understanding of the tar sands to this degree of simplicity, however, is to deprive oneself of an important factor in the overall significance of the oil sands in Canada's energy future. Those that chose to overlook the technical aspects of the tar sands run the risk of formulating an uninformed opinion, or, frequently in the case of politicians, a deficient policy.

To be familiar with the actual composition of tar sand is to be compelled to appreciate the technical complexity required to produce a superior high quality synthetic crude from a raw material which for all other modern applications is quite useless. All too often, politicians and economists, when facing the question of whether or not to develop the tar sands, are completely unaware of the technical expertise that industry has had to develop in the past, and of the precise nature or the challenges that lie ahead. As it is first and foremost the technology, the research and the development that will produce the oil to be extracted from the tar sands, I feel an understanding of the concepts outlined below would contribute greatly to a more rational approach to policies related to the development of the tar sands.

Definition.

The AERCB definition of oil sands is as follows: "A naturally occurring viscous mixture, mainly of hydrocarbons heavier than pentane, that may contain sulphur compounds, and that in its naturally occurring viscous state is not recoverable at a commercial rate through a well," using primary and secondary recovery methods common to the petroleum industry [28]. To understand the actual relationship the components of tar sand (sand, water, and bitumen) have to one another, imagine a grain of sand surrounded by a film of water; interspersed between all these granules of sand surrounded by a shell of water is oil. As will be explained later, that film of water is critical to the entire commercial producibility of the oil sands.

Technical Explanation of Contents .

Scientists are not agreed on the exact origin of the tar sands. One theory is that the oil was formed locally and has never moved. Since the oil sands are buried under a relatively thin layer of overburden, thermal cracking of the oil has not occurred, indicating that the oil sands are geologically young. The other theory assumes the oil originated elsewhere, starting out much like conventional crude, and then flowing into the sand deposits which may have been filled with water. This theory is based on the finding that some characteristics of Athabasca bitumen resemble those of more southerly located conventional crude deposits [29]. Whatever their origin,

"On average, by weight, sand represents 84% of the material, with bitumen and water making up the remaining 11% and 5% respectively. The bitumen, in turn, is made up of 50-60% oil (on average), which has a higher nickel-vanadium porphyrin content than conventional oil, 30-35% resins and 15-25% asphaltenes. The oil ranges in API gravities from 7-12 degrees, that is, it is a relatively heavy oil, and it has quite a high sulphur content, anywhere from 4.4-6.0%. As a hydrocarbon material, it is midway between a medium crude oil (13 mass % hydrogen) and a subbituminous coal (6 mass % hydrogen). Hence, upgrading technologies contemplate either hydrocracking (hydrogen addition) or coking (carbon reduction) as a means of converting the bitumen to a synthetic crude oil similar in properties to natural light/medium crudes [30]."

The above explanation merely deals with averages. The actual parameters are much more varied than might be considered. For example, while bitumen makes up, on average, 11% of the oil sand by weight, it can range anywhere from 1-18%. Consequently, all technical equipment developed and employed by present and potential producers must take into account such factors. Wide-application machinery, it should be noted, is not only more prone to technical malfunctions, but also involves considerably higher than average costs.

Reserves.

There are four main deposits of tar sands, together amounting to 981.2 billion barrels of oil. And yet, they have enjoyed since their discovery more than a hundred years ago the most ignominious of fates. In the words of one report:

"Despite their incredible size in excess of 300 billion barrels of recoverable synthetic crude and being relatively close to the world's largest market, the tar sands remained relegated to a footnote in Canadian oil reserve estimates [31]."

To put these figures into perspective, the remaining conventional reserves around the world (this excludes other tar sands and oil

shale deposits) are estimated to be 640 billion barrels [32]. According to the AERCB, Alberta's oil sands deposits represent one third of the world's known potential of bitumen reserves [33]. The wealth of petroleum in Alberta's oil sands was described by G.J. Demaison of Chevron Overseas Petroleum Inc. in a comparative perspective like this:

"The heavy oil deposits of western Canada or eastern Venezuela (1,050 billion bbl) are individually comparable in size to the proved oil-in-place of the entire Middle East. The Athabasca deposit alone is the world's largest self-contained accumulation of hydrocarbons (625 billion bbl), and, thus, is at least four times as large as the largest of all (conventional) fields, Ghawar in Saudi Arabia [34]."

Together with the Orinoco heavy oil belt in Venezuela, the tar sands in Alberta account for 91% of the heavy oil reserves estimated in the world. These figures are truly huge. Their importance to Canada's petroleum future cannot be understated.

Consider also a scenario in which the world, having exhausted its conventional crude, turns to heavy oil as a substitute. This concentrated volume of oil has the potential to evoke even more bizarre geo-political trends and possibilities than the conflicts and changes which have occurred in the last twenty years as a result of the world's need for oil.

Technical Limitations to Reserves.

Although the Athabasca, Cold Lake, Peace River and Wabasca deposits cover an area approximately 112,000 square kilometres (43,000 square miles), or 1/6 of Alberta's area, the size and volume of these deposits are somewhat misleading. Some of the limitations may already have been implied above; these too require added clarification.

"While on the one hand, the broad geological appearance is that the contained bitumen resource is of world scale importance as it is equivalent in volume to about one half of all the known in-place conventional oil resources thus far discovered in the world, it is consideration of the detailed geological character of the host sediments which may alter this perception. Indications are that recovery of the bitumen will be highly variable, eventually becoming negative in a thermal energy input-output sense for many parts of the deposits.

Bitumen saturation, thickness, quality of saturated sand may vary considerably within each deposit. In mapping the resource, it has been AERCB practice to include all areas with at least 1.5 metres of massive sand containing 3 mass percent of greater bitumen content. This method of mapping, while it assists geological limits of bitumen impregnation, at the same time results in fairly low quality areas being counted in the resource [35]."

"The total oil content of the (Athabasca) deposit has been observed to decrease by as much as two thirds or more over horizontal distances of only one-half mile even though the thickness of the gross interval remains relatively uniform [36]."

It has therefore been estimated that as much as 80% of the oil reserves could be contained in only 40% of the total volume of oil bearing sands.

Moreover, oil sands occur anywhere from 0-2000 feet beneath the surface. The AERCB has therefore chosen to classify the oil sands into two categories; those that are relatively close to the surface, where the economics of surface-mining the oil sand are favorable, and those that are beneath the surface in excess of 250 feet, where it is considered more economical to develop and produce the oil in place. This latter form of production is called in situ. (Presently, only the Athabasca deposit is being commercially developed, as it is both the largest deposit with the highest saturation of bitumen, and also the place where most of the shallow deposits occur. Suncor and Syncrude, both mining facilities, are located here. Alsands, one of two proposed pro-

jects, will also involve mining extraction on the Athabasca deposit. Cold Lake, synonymous with the proposed project being developed by Imperial Oil, a subsidiary of Exxon, will be the first commercial plant not only located on one of the other major deposits, but will also pioneer in situ production on a commercial scale.)

Approximately one-seventh of all the tar sands deposits are considered mineable, whereas the remainder will have to be developed utilizing in situ technology. The AERCB calculates the former amount to be in the vicinity of 77 billion barrels.

"However, looking at technology demonstrated to date and accounting for the fact that environmental corridors, and some isolated small pockets of resources would not be recovered, and also considering the fact that current projects have caused the sterilization of some reserves due to the placement of surface facilities, the AERCB has estimated the established bitumen reserves to be 30.3 billion barrels, or approximately 43% of the potentially mineable reserves. This quantity of crude bitumen, when upgraded, would yield approximately 25 billion barrels [37]."

EMR shows mineable recoverable oil sands reserves at 26.6 billion barrels, with in situ reserves at 250 billion barrels [38]. In a slightly different form, the R/P ratio for mineable oil sand is 660 years. This is enough bitumen for 22 large projects, assuming an individual daily production rate of 100,000-125,000 bbl. and a project lifetime of 25 years. But the AERCB warns that failure to locate future surface and upgrading facilities and other infrastructure in general on land containing insignificant amounts of bitumen or none at all, will result in the possible number of mining projects dropping precipitously to between 15 and 17.

To arrive at these figures, the AERCB has developed a very sophisticated set of equations which allows it to determine an optimal recovery rate from mining operations.

"Maximum economic recovery will occur when the pit limit is extended to the point where marginal costs at the pit limit balance marginal revenues obtained by recovery of the ore. At the limit, net revenue would be zero, but would be positive for all ore as the pit limit is approached."

Since the Economic Stripping Ratio, as it has been named, is defined as the value of ore per ton less the average total production cost (less the stripping cost) per ton, all divided by the stripping cost per ton of discard, it becomes obvious that the price of the ore, i.e. the price of synthetic crude, and the costs of production have a direct relationship on increases or decreases in the size of recoverable reserves.

Present AERCB guidelines dictate that oil sand reserves cannot be considered "established" until commercial viability has been demonstrated. For instance, production capacity times the expected lifetime of both the Suncor and Syncrude projects have been used to derive a figure which is included in established reserves. As other commercial projects come onstream, their production will be factored in. In the words of the AERCB, it would be "premature to place deeply buried bitumen resources in the established reserves category." Once Cold Lake proceeds, this policy will be reviewed.

A more plausible method by which the reserves of all the oil sands deposits could be calculated was developed earlier by the AERCB, but as yet, these results too are unofficial. A kind of efficiency/recovery measure, the thermal ratio is defined as the

amount of energy recovered from a given formation compared to the amount required for the recovery scheme. "A thermal ratio of 1 indicates that all the energy recovered is utilized, and no physical or economic profit accrues. Larger values indicate more attractive prospects [39]." Compared to the stripping ratio, the thermal ratio more closely parallels an energy input/output model, and only indirectly takes price into consideration. If, for example the BTU amount of coal input for steam flooding recovery equals the BTU output of synthetic crude, the thermal ratio should be one. But if the price of coal is cheaper than the price of synthetic crude on a BTU basis, then an economic profit will occur. The AERCB concluded that at thermal ratio 3, 176 billion barrels are economically recoverable. Using all methods, with little regard for efficient energy input, the figure for ultimate recoverable reserves escalates to 300 billion barrels [40].

In short, the actual deposits are highly variable geologically speaking, and only a fraction of the in-place reserves will be recoverable under certain economic conditions. The sheer size of the tar sands, however, belies even the most pessimistic of recoverability estimates. 200 billion producible barrels must be considered an absolute minimum. While not the only reason for developing the tar sands, the gargantuan size of these deposits is surely the overriding consideration. With Canada's remaining conventional crude reserves standing at less than 4.78 billion barrels, the supply potential of the tar sands presents itself as better than sublime.

Cost/Benefit Analysis of Oil Sands Development.

Despite this wealth of oil over and above the limitations outlined above, there are still a host of problems which development of the Albertan oil sands faces. Most of the disadvantages result from the peculiar composition of the tar sand. On the other hand, most of the advantages are due to the output. It should be pointed out here that the scale of these problems was and will continue to be quite unlike anything that the oil industry has ever tackled before. Similarly, the net benefits derived from the oil industry stand to be greater to Canada as a whole than they likely could be otherwise.

Disadvantages.

Cost and Economies of Scale.

One of the most demanding of all problems oilmen have to face, of course, is that of cost. Whereas it took \$250 million to erect Suncor in 1968, it took close to ten times that amount to construct Syncrude a decade later. All projects on the drawing board now carry price tags that are several multiples of even the Syncrude cost.

The question that inevitably comes to mind is, why so much?

The need to develop and maintain economies of scale in the production of synthetic crude are vital.

"The quantities of bulk materials to be moved each day are truly gigantic. While economies of scale demand mining machines, each capable of digging 30,000-50,000 cubic metres (one cubic metre=6.2898 barrels), obviously any significant downtime on one such machine owing to such things as equipment failure, or faulty mine scheduling will sooner or later cause production short-falls [41]."

Recalling that, on average, bitumen only accounts for 11% of the material by weight, it is clear that a large amount of throughput or feed material is required to produce a relatively small amount of oil. In fact, according to Syncrude, one cubic metre of tar sand yields 1.4 cubic metres (sic) of sand, and only .22 cubic metres of bitumen, which, when upgraded, in turn yields The dominating weight factor of the sand necessitates equipment, at least for mining facilities, that is capable of processing large amounts of very heavy material.

(For in-situ production, it is not so much the sand that poses the problem as it is the viscosity of the oil. API gravities of 7-12 degrees are indicative of an oil which "is not recoverable at a commercial rate through a well." Hence, for in situ productions the means to production is limited to methods of coaxing oil, that is, as thick as molasses upwards.)

Syncrude Canada has a list of statistics that reveals the fantastic scale an oil sands mining plant must achieve to produce 129,000 barrels of oil per day. The entire plant processes 312,000 tons of tar sand per day. Draglines, of which there are 4, each costing \$30 million, are used to pick up the sand from the pit and to discard it where a bucketwheel reclaimer will transfer it onto a conveyor system, which in turn will take the sand to the plant. Each dragline weighs 6,750 tons, has a boom length in excess of 110 metres, and a capacity of 80 tons. The

yearly capacity of a dragline is 93 million tons. The bucketwheels, of which there are 14 in total, are 41 feet in diameter, and have a capacity of 7,000 tons of sand per hour. Syncrude has 5 boilers which are used to separate the oil from the sand; together they have a capacity to produce 750,000 pounds of steam per hour. There are roughly 20 miles of conveyor belts made of steel 2.1 metres wide and three centimetres thick. The open pit mine area is 4.2 km long, 7.5 km wide and 60 metres deep. The plant area covers 5 square kilometres, and the tailings pond area, into which waste or unrecoverable bitumen is temporarily discarded, covers another 30 square kilometres. (Before the plant site was even stripped of the overburden covering the oil sand bearing ore, the entire area had to be drained; the cost of diverting a single creek away from the proposed mine area was \$35 million.) The utilities plant servicing the project has 260 megawatts of installed capacity, which is sufficient to light a city with a population of 300,000. To construct the entire project took a total of 43 million field manhours [42]. All this together makes Syncrude the largest open pit mine in the world.

Is it any wonder Syncrude cost \$2.3 billion?

Tar sand technology must be developed from scratch when it cannot be adopted from existing technologies and adapted to different requirements. Such was the case with Suncor, which mines the oil sand using bucketwheels, which are the largest of their kind. They were bought from the Krupp concern, a large coal producer in Germany's Ruhr valley. These extraction (or mining method) examples, however, are only descriptions of the processing of the material before it reaches the plant gate. From there,

the oil sand is separated, hydrotreated, desulphurized and upgraded. For in situ production, the separation process is conducted underground, but the other additional steps are still necessary. To achieve these steps, given the complex and variable content of bitumen, certainly requires novel equipment. Novelty is closely linked with expensiveness: "When an industry's price of output rises substantially, there are likely to be increases in the prices of its factor inputs, especially where the inputs are specialized to the production of output whose price has risen [43]."

Suncor, before it announced plans to expand its facilities, produced on the order of 45,000 barrels per day. This was considered to be an absolute minimum for plant capacity. Yet, because of periodic difficulties Suncor experienced and the negative effect this downtime had on profitability, Syncrude Canada decided to implement dual production lines, so that any given stage of the production process could be temporarily isolated in case of technological breakdowns or maintenance, without totally disrupting production. Production capacity of Syncrude was nearly trebled from that of Suncor's, but then again the costs increased markedly as well. "Operation of the first tar sands plant strengthened the conclusion that size is one of the key factors in the commercialization of the tar sands [44]." This point cannot be understressed.

Both Alsands and Cold Lake have proposed capacities similar to that of Syncrude's. Logistical problems that would occur at greater capacities seem to reject further leaps on the magnitude of that between Suncor and Syncrude for future projects. Because

Syncrude and Alsands will parallel each other in scale and manner of operation more closely than any other two of all the projects, the differences in their prices, \$2.2 billion for Syncrude as opposed to the most recent estimate, which was greater than \$10 billion for Alsands, warrants further discussion.

Largely this difference is a result of two things, namely cost inflation and simple waiting. As the worldwide demand for large, specialized equipment grows to meet the pressing needs of superproject construction, and as the number of suppliers essentially remains stable, there is no direction for the cost to go but skyward. The effect of delay is shown by the example of both Alsands and Cold Lake which applied to the AERCB for approval of their projects in the latter half of 1979. Final approval is now not likely to occur until mid 1981. At an annual inflation rate of 10% per annum, the cost of these projects just by being forced to wait has increased by a billion dollars or more. Estimates now figure that each year of delay will increase the cost for each project by an additional billion dollars [45]. Essentially, the cost of oil sands projects has been inflated by both the industrial price index, disturbed upwards by higher demand, and the consumer price index, as an indicator of the cost or devaluation of money. There can be little doubt that this trend can only continue in the future.

A recent suggestion printed by the "Financial Post" was that if less attention were given to economies of scale, thereby reducing production capacities, and cost, erecting a tar sands plant would be a more attractive prospect to smaller producers, who lack the financial clout the major players have -- clout

which is apparently a prerequisite for entering into the tar sands game. This, unfortunately, is a naive and narrowminded proposition. Syncrude and both the proposed Alsands and Cold Lake projects intend to form consortia, which besides being more favorable for tax purposes, both reduce the financial risk incurred by each of the consortium's members, and make a piece of the action available to smaller companies. Minority participants, moreover, do not take on any technological risk, as it is usually the project's majority participant, most often a multinational subsidiary, who is responsible for that aspect of the endeavour.

Nevertheless, the cost of such projects is enormous, as has been shown. Financing, as a function of cost, is an issue which will be dealt with in the context of the pricing dispute. Once again, it is the Canada West Foundation that has the most cogent statement to make on this subject: "Canada could well be faced, over the next quarter century, with immense expenditures to develop what could be the highest cost oil and gas in the world. The costs of this effort will be immense: the costs to all Canadians of not undertaking the development could be even higher [46]."

Infant Technology.

Extraction of oil from the tar sands on a commercial scale is a relatively new phenomenon. Suncor only began production in the late sixties, with Syncrude coming onstream a decade later. Even so, the differences between them are not all that great. This is not to say that improvements haven't been made, but it would appear that in the context of overall requirements, present oil sand technological skill and knowledge is still near the bot-

tom of the learning curve.

For the time being, mining itself (and of the Athabasca deposit in particular) will continue to be the most commercially attractive scheme of production as opposed to in situ production. As one economist explained it,

"neglecting the foregone future use of oil sands leases is less crucial than for deep deposits. The relative future value of deep versus shallow oil sands deposits becomes a function of the expected differential in the costs of surface mining and in situ [47]."

Most of the research and development being carried out, however, is focused on the in situ methods, as therein lies the long term potential of the tar sands. To date, there are some 37 pilot projects evaluating various techniques for bitumen extraction. Some of the more popular concepts described in recent literature include the cold water process, fluidized solids technique, in situ steam drive, in situ combustion, sand reduction, anhydrous process, and by far the most intriguing, in situ recovery by nuclear explosion [48]. In 1959, permission was granted to set off a nine kiloton explosion 64 miles south of Fort McMurray at a depth of 1,250 feet. Like some of the other methods mentioned, the purpose of this was to heat the oil in place, thereby reducing its viscosity and causing it to flow to the surface. An international moratorium on nuclear explosions restrained the experiment.

Mining of the oil sands today involves techniques that were developed decades ago. Primary extraction, where most of the sand is removed from the bitumen, makes use of the "hot water principle"; raw tar sands are mixed with hot water and chemicals, which causes the oil to be ruptured only as a result of the film of water surrounding the sand, and causing the bitumen to rise to the

surface as a froth, which is skimmed off, while residue sand settles out at the bottom. Secondary extraction involves the "washing machine method", whereby the "fines", or small particles of clay described as being finer than talcum powder, are removed. Because sand has a higher specific gravity than oil, it is forced more to the rim when the mixture is centrifuged. The centrifuge concept originated when one enterprising oil sands man found that he could cause coarse bitumen separation when he put the material into his wife's washing machine. Suncor and Syncrude use refined prototypes of these principles, with the latter's being somewhat more sophisticated than the former's. Alsands intends to use the Syncrude method.

Technological improvements now center around the following goals: through research on different extraction methods, the elimination of non-compactible sludge as a waste-product, or tailings as they are called, 100% water recycling (the hot water process requires vast amounts of water, of which only a fraction is recoverable from the tailings before it is discarded into the tailings pond), improvement of the energy input/output ratio (i.e. raising the thermal ratio) and finally, an earlier start for reclamation of the disturbed environment, notably the mine pit and the tailings ponds.

Environmental Impact.

Environmental considerations loom large when questioning the value of developing the tar sands. Larry Pratt, a political scientist at the University of Alberta, delivered a heated attack against the multinational oil companies for devastating the environment for the single-mindedly capitalistic purpose of ex-

exploiting Canada's natural wealth in the oil sands. His book is entitled "The Tar Sands: Syncrude and the Politics of Oil", and was published in 1976 [49].

The book opens with a horrifying account of viewing the Suncor site from the air: a wasteland. Pratt goes on to describe the disgusting sight of the tailings pond resembling one giant oil slick, and to detail the degree to which the air was being polluted. An estimate of the disturbance to the ecosystem by the significant withdrawal of water from the Athabasca River for the hot water extraction process was also offered.

There appears no apparent alternative but laying the muskeg countryside bare for an oil sands mining operation. In the middle 1960's, when construction and planning for Suncor took place, Fort McMurray was a town virtually unheard of, and the economic rehabilitation the project brought to the town more than offset the complaints of environmental devastation. With respect to the size of the entire countryside, Suncor's damage could only have had but a negligible effect. Reclamation and revegetation were low on the priority list for Suncor. Pratt's description is adequate evidence for this.

But Pratt based his prognosis for further environmental disregard solely on the Suncor experience -- his book was published before Syncrude actually began production on July 31, 1978. To base a trend on a single piece of data is at best foolish and at worst misleading. Time, after all, has shown us several important things. The conservationist ethic has become a politically salient subject in the 1970's, and few large megaproject proposals escape the eyes of environmental lobbyists.

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This is certainly true of Syncrude. Syncrude is required by Alberta law, as a condition to the project approval issued by the AERCB, to conduct a research reclamation program and to present annual progress reports.

"The reclamation objective is to return the disturbed site to a vegetative cover having a productivity which is equal to or greater than that which existed prior to disturbance. The reclaimed area must also be compatible with the neighboring natural areas.

To accomplish this the vast quantities of tailings sand must be reformed into a soil which is capable of supporting native plant communities. Researchers at Syncrude are looking for ways to use indigenous materials with the tailings sand to simulate a naturally-formed soil. Native plant species are being tested to see how well they will grow in such simulated soils and to evaluate their potential for use in large scale reclamation projects [50]."

Revegetation of the mine pit will begin well before the end of the project's lifetime. Since the amount of tailings sand is 30% larger by volume than that of tar sand, the reclaimed area will be approximately 30 metres above the original level, and will be gently contoured to provide good drainage, as opposed to the previous muskeg. "Planted shrubs and trees will gradually compete with the herbaceous plants, gaining dominance in about 10 years, and producing a relatively stable forest community in about 30-50 years," eventually resembling the original natural forest [51].

That Syncrude's involvement in reclamation is extensive cannot be questioned. Over 50 reports have been published, and word of its reclamation progress is periodically noted in journals and periodicals. Perhaps one of the more intriguing devices the company has devised is one designed particularly to ward off birds from the oil-slick tailings pond. Now presiding over the pond is

a mechanical scarecrow, dubiously dubbed Bituman, which will simulate human movement, and is lit up at night. This, and clearing of the shoreline vegetation near the pond to make it as unattractive to birds as possible, have proven to be effective and relatively inexpensive ways of preserving the wildfowl in the vicinity.

Furthermore, cause for total desolation of the landscape is unfounded. Whereas about 70% of the area used in a mining operation is disturbed, only 14% is estimated to be disturbed by in situ production. Land clearance for in situ production is only needed for the location of wells, pipelines, roads, and the upgrading facility, not for the orebody as well.

The emission of sulphur dioxide into the atmosphere is an item, however, that should be examined more closely. The use of bitumen or coke as an input fuel for the operation, since both contain relatively large amounts of sulphur, will if not over the short term then definitely in the long term result in air pollution problems. While the Syncrude operation is closely monitored, and though instances of emissions that exceed maximum permissible standards are reported to the Alberta Environment Ministry, there is no indication that the standards are being tightened for the Alsands project. The conditional clause in the approval for the plant simply reads, "(The projects environmental control systems)...will result in the gathering and delivering to the sulphur recovery plant of the maximum practical amount of gaseous mixtures containing sulphur [52]." Like Pratt, I am skeptical of claims that air pollution standards are not being relaxed simply by not being tightened, and skeptical that violations of the

standards are not virtually ignored.

The issue of water usage has reached the attention of the AERCB, however, and it is highly critical of Alsands intent to apply little else than existing technology to improve water use efficiency. For the in situ processes, even larger amounts of water are required than the hot water process, primarily to generate the (oil) viscosity reducing steam. An estimated four barrels of water are needed to produce one barrel of oil. Reuse of the steam which permeates the oil is presently not practical but is "being investigated". The Cold Lake project, which falls under this category, is also coming under close scrutiny regarding water usage; any substantial environmental impact Cold Lake exerts on the surrounding watershed is highly likely to have ramifications for future in situ schemes.

Socio-Economic Impact.

The sudden onrush of billions of dollars of equipment and personnel cannot but have a substantial effect on the socio-economic flavor of the communities near which tar sands projects choose to locate. This has been particularly true of Fort McMurray, as this town has had to absorb the impact of both the Suncor and Syncrude projects.

Pratt deals forthrightly with the degree of this impact. Recalling once again that his book was written during 1975/1976, it is important to put this both in a relative and historical perspective. As Pratt began writing, Syncrude construction had already been under way for close to two years. It is safe to say that the on-site work force was nearing its peak of 7500, and

that their presence, and hence the strain which they caused on the socio-economic fabric of the town, was also close to a maximum. That Pratt was so negatively impressed is therefore not hard to explain. Fort McMurray, as will other towns in the future, had undergone a population explosion. From 1972 to 1978 the town's population increased from 6,500 to 28,000. That the existing infrastructure was inadequate in terms of housing and public services is not hard to imagine. Roads were muddy and trailer houses abounded. Now, with the advantage of two years of hindsight, it is possible to reassess the status of Fort McMurray. Having renegotiated the corporate tax arrangement with both Sunco and Syncrude, and raised the local tax rate for residents ("To have low taxes in an area where incomes are high, services are high and the value of property is high is not consistent [53]."), the situation seems not only to have been brought under control but also to be achieving a degree of unexpected improvement. A new 300 bed hospital was recently completed at the town's expense of \$41 million, and plans are now being made for improving the transportation system, particularly the roads to and from the projects, as well as to Edmonton. Retail services have expanded rapidly, thereby allowing a more orderly balance between supply and demand.

Several extensive changes for the better have occurred as a result of tar sand development in the Athabasca region. Fort McMurray has applied to the Albertan government for city status for fiscal reasons, anticipating further growth and development. In fact, "Fort McMurray has come out of those five years of stress and evolved into a vibrant northern community that boasts of a variety of opportunities, services, cultural and recreation-

al programs which put many cities its size to shame [54]." In contrast to the past, the future socio-economic effects tar sands development in the Fort McMurray area will be more manageable. Syncrude and Suncor both realise that the impact of their presence in the vicinity is profound; for each of their employees, approximately three other persons are indirectly employed in the area. Consequently the companies have donated large sums of money for the purpose of stabilizing social development, and have established work and educational programs for local and native people.

The absorption theory is perhaps a spin-off from the learning curve theory, but in the case of Fort McMurray, it is a valid one. Judi Dicks and Ted Mason, both members of the Fort McMurray chamber of commerce, explained the past and future trends for Fort McMurray: "At GCOS's (Suncor) emergence on the scene, there were only 1,200 people in the town. Syncrude came when the population was 6,500. In both cases, the effect of the plants was tremendous. We are of sufficient size now to absorb any negative effects Alsands will create." Curiously the rapid development has had little effect on the community's cohesion. Involvement is high ("We have more respondents for board applications than we can use."), and the spirit strong; residents go out of their way to welcome strangers into their community.

The experience gained from Fort McMurray may well be applied to other towns as tar sands development continues. Alsands will finance and construct an entirely new town north of Fort McMurray to accommodate the workers of its project nearby, providing the basis of a new town for future projects also likely to locate in

the vicinity. The direct costs of so doing were calculated as being marginally higher than if Fort McMurray had been expanded yet again. The indirect and long term benefits derived from the new town were deemed by the AERCB as an impetus to other projects, a respite for Fort McMurray, and generally, "in the interest of orderly future development of the Athabasca Deposit." [55]. All indications, as reflected in extensive AERCB testimony and reports, show that the lessons learned from Fort McMurray will be incorporated into future policy in order to avoid those mistakes to the maximum possible extent. The social and economic havoc that prevailed in Pratt's heyday at least appears to have been left behind.

Lead Time.

To organize, plan and construct a tar sands plant takes an extremely long time. From the project definition phase to actual production start-up now requires a lead time of about 10 years. This decade includes the following stages: one to two years for project approval from the AERCB, one to one and a half years for process design and detailed estimates, three years for detailed engineering, which overlaps a five year plant-construction phase [56]. For example, both Alsands and Cold Lake, although already approved by the AERCB in 1979, are not expected to come onstream before well into 1987, if not even 1988. The fact that haste makes waste, especially in the tar sands game, is exemplified by Suncor and its persistent technological design problems; only five years elapsed from the planning stage to the point of final construction.

The inherent disadvantages of such a long term start-up are numerous. Members of the consortia must attempt to minimise those two factors which most affect the profitability of such ventures, namely the price of the product and the cost of construction/production. Costs of construction and production are, to a limited extent, within the oil companies' influence (the costs of waiting, however, are not), and as such, they receive a great deal of attention and funding. But these, in turn, are a function of the viability of the project, which ultimately will hinge on the price for the end product, synthetic crude. Because the price is controlled exclusively by the government, expectations of oil companies in their estimates of a minimum price for their product are undermined by purely political considerations, as we will discuss later. Hence, oil company consortium members seek some sort of guarantees for their product from government.

Advantages.

Increased Long Term Supply.

First and foremost of all possible benefits, of course, Canada will have a new supply of crude oil which will replace the diminishing existing stocks. But synthetic crude produced from the tar sands is no ordinary oil.

After the sand has been removed from bitumen, the bitumen is upgraded and hydrotreated. The result is a high quality crude oil which "is better than conventional crude." Because the Syncrude operation has equipment which will allow it take "advantage of a variable ratio in blending the two hydrotreated streams, optimum

feedstock requirements of individual refineries can be met. In addition, these streams can be blended to form a high quality fuel oil to meet the most stringent pollution regulations [57]." What comes out, in somewhat technical terms, is a "bottomless" light crude oil, at or above 30 degrees API, which has a high yield of gasoline and other desirable light distillates. It is called bottomless because such residuals as sulphur and ash, normally present in conventional crude, have already been removed. The hydrotreating and desulphurization processes that take place in tar sand upgrading plants are already primary forms of refining. The flexibility designed into the Syncrude upgrading facility (and as it will be designed into others like it) allows Syncrude to compete effectively with conventionally produced oil because almost any refinery feedstock requested by a refiner can be met. In addition, most industry experts feel that on the open world market, synthetic crude oil could command up to an additional dollar per barrel because of its favorable characteristics for refining with respect to conventional crude.

Suncor production averaged 44,000 bbl/d in 1979 [58] of this highly desirable commodity. Syncrude production stood at 110,000 bbl/d by December of 1980 [59]. Syncrude's production alone represents 6-7% of Canada's present crude oil demand [60]. This is not an insubstantial figure when one considers the proposed increases of tar sands production. Suncor has proposed a 13,000 bbl/d expansion. Similarly, Syncrude intends to bring a third production train onstream, increasing rated capacity from 129,000 bbl/d to almost 200,000 bbl/d. Cold Lake will produce 140,000 bbl/d. Alsands: 137,000-140,000 bbl/d. The total of these figures alone is 536,000 bbl/d.

What is important to realize is that despite the fact that their production capacity is several times that of conventional oil fields, tar sands plants have a life expectancy of 25 years. The quarter century lifetime, of course, is small when compared to the R/P ratio. The significance of this fact is hard to diminish: Development of the tar sands will provide Canada with access to a long term, very large and secure source of highly desirable oil within Canada itself.

Benefits of Macroeconomic Multiplier.

When contemplating development of the tar sands, the extensive discussion on the negative macroeconomic effect of imports is essentially reversed. Dollars spent within the country have a multiplier greater than zero, whereas that of dollars spent on imports is only equal to zero. Similarly, the effect on the balance of trade is reduced by an equivalent amount that would otherwise have added to the trade deficit. Furthermore, spending on research and development and on equipment made in Canada to produce the oil, apart from spending on the oil itself, will have a profound effect in stimulating the Canadian economy.

In what can best be described as an attempt to quantify the extent of that effect, Gerry May, from the University of British Columbia, constructed an econometric model of the Syncrude project. He concluded that, "With regard to cost-benefit analysis, Syncrude as a whole seems to be a rather marginal venture. Such (oil sand mega-) projects can hardly be justified on the basis of their (macroeconomic) aggregate effects, if the cost benefit results are unfavorable." Keeping in mind that May feels the project is "marginal," it would be valuable to examine the assump-

tions on which his model was based. The first and most egregiously errant assumption was that concerning oil price escalation. The price of domestic conventional crude was to have risen to world level equivalence by the time Syncrude's production came to market. The second assumption was that inflation would remain unchanged over the project's twenty-five year life at 4% per annum. The cost of capital was to have equalled 7.44%. Finally, the world price of oil was to rise at the rate of inflation, and not at all in real terms.

May went on to argue that in terms of macroeconomic benefits, Syncrude does not have much to offer. The demand for goods generated by the Syncrude spending is not followed by an immediate response of domestic production, at least not of the same magnitude. Moreover, Syncrude isn't needed for balance of payments purposes; the value of the dollar is flexible so that it will rise or fall, adjusting itself to the trade balance position. His final argument against Syncrude on economic grounds is based on his prognosis for income. "Increased income gives rise to increased demand for goods and services, part of which is satisfied by greater imports and smaller exports. Concurrently, interest rates are up, inducing capital inflows."

History has shown that some if not all of these assumptions were absurd. History has also shown that Syncrude is far from being marginal.

May's arguments, based on computer generated numbers, are not acceptable. He himself said of his assumption that energy sources would continue to grow at a rate reflecting the traditional economic growth in general, that it "invites some rather

well deserved criticism." In many respects, many econometric models are extraordinarily naive and simplistic, and May's is no exception. His comment that interest rates are a function of something other than maintaining a spread between the U.S. and Canadian rates is unrealistic. Equally unrealistic is his view of the dollar and the role it plays in the balance of payments. He decries the endogenous factors that play an integral part in the Canadian economy. The failure of computer models to put a value on assumptions, as well as human actions, decisions, and intervention in the normal course of economic proceedings will forevermore be the Achilles heel of those models.

May felt that the increased demand for goods due to increased income would lead to more imports, thus creating a net trade balance deficit. By failing to account either for the difference between Canadian and world prices, or for an increase in the amount of oil imported into Canada, and by failing to take into account the increasing complexity of the international political scene and the dramatic effect of that complexity on oil prices which led to increases well above the rate of inflation, May attributed the cause of increased imports to exactly the wrong reasons.

It is ironic that his arguments should support the supposition of this paper that increased imports have profound negative effects. May, of course, has gone a whole step further, having assumed that the balance of payments account was in order. It is possible that he has identified an eventual problem, but has solved question two before solving question one in a game where questions must be solved sequentially.

The problem caused by the slackened demand for labor after the construction of a mega-project is completed, i.e. higher unemployment and slower economic activity, may himself solves. He suggests that the workforce could be used in a staggered manner by continuously building tar sands projects. This has been a widely applauded concept, and it makes both economic and logistical sense. The overall benefits of such a scheme, i.e. allowing the plants to come onstream at three year intervals would "provide a relatively constant stimulus to the economy and assure a fairly smooth growth rate."

The AERCB, in its decision to grant approval to the Alsands project, examined the impact the project would have in the regional, provincial and national arenas. On the basis of a provincial income multiplier of 1.8, the total direct and indirect income impact of the construction and operating costs to be spent in Alberta between 1981 and 1986 would be \$30.1 billion. In addition,

"the impact of the project on Canada's balance of payments was put at some \$17 billion through reduced needs for oil imports. The Board estimates from its higher projected oil prices that the federal government would receive some \$10 billion from corporate tax payments, and that the impact on the balance of payments would exceed \$40 billion. Alsands estimated the undiscounted net benefit to Canada at some \$7.4 billion. The Board estimates the quantifiable net benefit to Canada as totalling some \$27.5 billion, or three times greater than Alsands' estimate. The benefit to Canada from Alsands' oil production is, (in any case) in the Board's view, self-evident [61]."

While some might question the difference between these last two estimates and the motivation behind them, it is safe to conclude that the net benefit to Canada will be several times the nominal cost of construction and production.

Existing Technology/Learning Curve.

The learning curve theory, rarely espoused by proponents for tar sands development, is quite relevant here. Because the technological and environmental obstacles for both surface mining and in situ production of bitumen are still manifold, they will continue to hinder the rate of development and will add heavy cost burdens until they are solved by further research. A mandate for such research has been issued not only by the AERCB, but also by the companies involved; improvements in technology that would materially reduce the technical costs of operations and/or improve the rate of recovery per unit of work input would similarly enhance the rate of return [62]. In short, it is in everyone's interest to move up the learning curve at the maximum rate.

That the learning curve phenomenon is actually occurring is evidenced by the improving operating efficiencies of the two existing, and the third planned, mining projects. By volume, the Suncor recovery factor (i.e. yield of synthetic crude and LPG's) is 56%. Syncrude has increased this to 65%, and the Alsands project will begin at a 68.1% rate, eventually moving up to 73.8%. Moreover, Syncrude gained valuable experience from Suncor, and eliminated specialized equipment, which is quite vulnerable to breakdowns, by replacing it with even more multi-purpose equipment. Syncrude obviously progressed along the learning curve, as shown by its increased uptime and profitability. There is little reason to believe that this trend can not continue into the future for other mining projects.

The Alberta Oil Sands Technology and Research Authority, AOSTRA, is an Albertan Government agency created by statute in

June 1974 with the expressed purpose of expediting technological development. It receives funds (\$144 million in 1977) with which it enters into partnership with several companies to construct and operate experimental in situ recovery pilot plants. Any new technology developed in concert with AOSTRA will be owned by the provincial authority and will be made available to other parties under existing agreements.

There has been considerable discussion that commercial in situ production should not begin until operating efficiencies for in situ production more closely approximate those for mining. The argument for production without the improved operating efficiencies will follow. The arguments against are that the tar sands would not be developed in an orderly way. If one had to choose between the Cold Lake and the Alsands projects as to which should be completed first, it is my feeling that the former should be given higher priority. The recovery factor of the Cold Lake scheme is estimated to be about 20% of the in place bitumen, scarcely acceptable to some when contrasted to the mining schemes. However, one should look at the advantages the Cold Lake project would have to offer in terms of the learning curve theory. By the time Cold Lake comes onstream as the pioneer in commercial in situ production in either 1987 or 1988, it will twenty years behind its mining counterpart, Suncor. Stated differently, we will have lost twenty years worth of time along the learning curve, however long the curve may be, in the development of in situ production. The pitfalls and complications of in situ production are only likely to emerge when actual commercial production occurs. Thus, Cold Lake would offer a valuable opportunity in illuminating more unidentified problems than would Alsands,

and hence would allow proceeding up the learning curve at a faster rate. Curiously, as only about 2,000 of Cold Lake's wells (or 20% of the eventual 10,000) will be installed when the project commences operation, it will have the benefit of more time in which to develop, put to practice and evaluate new technologies.

Clearly technological development has not progressed very far when contrasted against the long term needs and demands. We are close to the bottom of the learning curve. But the quantity of the tar sands that imposes these obstacles to development, at the same time offers respite from frenetic technological improvement, which, under the threatening supply/demand circumstances, would occur if the tar sands weren't as copious. Nevertheless, research and development geared towards improving the efficiency and environmental aspects of tar sands extraction is a function of the overall likelihood that the tar sands will continue to be developed on a commercial scale, which likelihood is in turn a function of its economic and profit-making viability.

Advantage of Defined Limits.

One clear advantage that the tar sands enjoy over any other hydrocarbon alternative in Canada is that they have been clearly mapped and defined. The AERCB has not only determined the physical extent of the various deposits, but it has now initiated detailed mapping of saturation levels. Thus, the time required for drilling for oil in conventional areas, as well as in the prospective Beaufort and Hibernia formations, and the inherent financial risk associated with each if they are not commercially exploitable, are not issues that concern the tar sands. As former

federal energy minister Donald MacDonald put it,

"We believe there is pretty substantial potential for oil development in Canada, in the Arctic for example, but this can only be established by drilling. There's a question of doubt as to how much oil is there. The oil sands are different in this sense, that we know there is petroleum there, and that it's really a question of putting into place a system that can bring it out [63]."

Long Term Continental Market Advantages.

Now defunct as a legitimate argument for the development of the tar sands, the idea of a continentalist energy policy and how it might relate to the tar sands is an interesting one. Pratt especially takes a hard line on the "Fortress America" concept, taking every opportunity to jab at American energy policy greedily looking towards Canada for a large, secure and exploitable source of petroleum in the tar sands.

Ever since the OPEC embargo Pratt's attack on American energy policy, Washington politicians, Walter J. Levy, the multinational oil companies and all their subservient Canadian lackeys in both the federal and provincial governments, and their plans to plunder the wealth of the tar sands for their own consumption, has been destroyed. Canada adopted an isolationist approach to dealing with energy, and in so doing curtailed exports to the United States. It is no longer probable at all, given the looming Canadian supply problem, that conventional or unconventional oil will find its way into export markets over the short term. The continentalist energy approach is now more strictly limited to Canadian-American cooperation on the construction of a MacKenzie Valley pipeline that will bring natural gas from the Arctic to south of the 49th parallel. Now that the continentalist energy

policy is deceased, and that the domestic energy need which Pratt failed to predict has been proven, Pratt's suggestion to hold up development of the tar sands in order to deny the United States access to synthetic crude supplies can be ignored.

If, however, we assume that development of the tar sands will proceed at a consistent rate such that eventually our Canada's demands could be more than adequately met, it is not beyond the scope of possibility that Canada could one day resume its role as an exporter of oil. Indeed, this is not at all a far fetched idea. Once again it is the reserves that come into play. To sketch a worldwide picture, depletion of conventional crudes will begin to exacerbate the supply situation, if not in 25 years time, then in 50. There will then be little alternative but to turn to heavy oil as a substitute.

The distinguishing features of heavy oil deposits such as the tar sands are that they are huge by conventional standards, few in number, and with the exception of Venezuela, located in even fewer, non OPEC countries [64]. The Athabasca deposit alone is the largest in the world. Oil importing countries will come to Canada in search of petroleum supplies, much the way the United States has done and much the same way other countries now do with OPEC countries. It is not hard to visualize an even more concentrated cartel of heavy oil producers, and yet another massive redirection of the world's financial flow. The label of Canada's oilmen as the "blue-eyed sheiks" may be appropriate today, but it might very well be even more so half a century hence.

If not ever an exporter of oil from the tar sands, there is little to preclude Canada from becoming an exporter of technology

to future heavy oil producers. Indeed, Canadian development in various extraction and upgrading methods is probably more advanced and is proceeding at a faster rate than in any other country with heavy oil. Large scale commercial production has achieved a better track record and a higher operating efficiency in Canada than anywhere else in the world [65]. By comparison, oil shale development in the United States is younger and its outlook not as promising, due to inhibiting environmental factors. While both oil sand and shale oil require vast amounts of water for extraction, the water supply in Alberta can more closely meet the needs for tar sands processing than the water supplies in the Colorado or Wyoming basins could that would be needed to develop shale oil [66]. Tar sand will continue to have a competitive advantage, at least in terms of development, over shale oil. If past and present trends continue, Canada will attain technological expertise that will be readily exportable. Not to export it would be foolish.

7. Oil Sands History

How did the tar sands come to be developed at all? A brief historical overlook outlining the significant episodes will enable greater appreciation for some of the difficulties the pioneering engineers, geologists, and entrepreneurs encountered in their efforts to extract black gold from an otherwise almost useless substance.

Pioneers.

Athabasca, the Cree Indian name for "where there are weeds," and its riches were first viewed and recorded in 1778 by a fur trader from Connecticut, named Peter Pond. He established a trading post at the junction of the Athabasca and Clearwater Rivers, calling it the "Fort of the Forks [67]." He was followed a decade later by Alexander Mackenzie, who wrote in his journal,

"At about 24 miles from the fork (of the Athabasca and Clearwater Rivers) are some bituminous fountains into which a pole twenty feet long may be inserted without the least resistance. The bitumen is in a fluid state and when mixed with gum, the resinous substance collected from the spruce fir, serves to gum the Indians' canoes. In its heated state it emits a smell like that of sea coal [68]."

The first practical application of tar sand, that of caulking canoes, had been discovered.

The region's economic potential, however, was not identified until almost a century later, when the chronicler of the Laird Expedition noted, almost prophetically, "That this region is stored with a substance of great value is beyond all doubt, and, when the hour of development comes, it will, I believe, prove to be one of the wonders of northern Canada." R.G. McConnell, work-

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ing for the Dominion Geological Survey, a government agency, reported in 1892 that "the tar sands evidence an upwelling of petroleum to the surface unequalled elsewhere in the world." It is dramatically ironic that these people were visionaries, more than three quarters of a century before their time, and that unlike many today, they recognized in the tar sands an extraordinary opportunity waiting to be seized.

In 1913, a young engineer, Sidney Clarke Ells, set out for Athabasca to survey the prospects of commercial production for the federal government mines branch, a task to which he devoted the next 32 years of his life. With the advent of the motor car, he quite plausibly cited paving material as the most promising use of tar sand. In the end, however, the cost of transporting raw tar sand to Edmonton from Athabasca for paving material was prohibitive. Ells also correctly predicted that "petroleum fields in western Canada will have a direct bearing on the development of Alberta bituminous sands [69]. In the report of his field work in 1913, Ells concluded that "certain areas should lend themselves to large scale commercial development," and that a profitable plant operation would depend on a large plant capacity. The following excerpt from that report demonstrates Ells' remarkable ability to foretell the destiny of the tar sands:

"In 1913 a great and potentially valuable natural resource in the northern part of the province of Alberta lay dormant and unknown while even the surface of the country was unsurveyed. Yet as a result of investigations in the field and in the laboratory, the outcome may ultimately be reflected in important commercial development. Where now the almost unbroken wilderness holds sway, industrial plants may arise and tall stacks dominate the landscape. Few will then pause to consider what these developments represent, but success will be the reward of those who had a part in the undertaking. It has been claimed that Canada's awakening North represents the greatest frontier remaining in the free world, and that the effect of its development on the future of industry and on the North American economy challenges the imagination. In due course, and when necessity arises, commercial development of the Alberta bituminous sand will play its part in the challenge [70]."

Dr. Karl A. Clark, working for the Alberta Research Council, conducted and successfully completed research on extraction of oil from tar sand bitumen. As early as 1923, the hot water method, or hot water flotation process, as it is more precisely known, was determined to be a viable technique. The hot water method is also known as the Clark method. Another earlier suggested method of extraction was forwarded by Robert Bell, of the Geological Survey of Canada. As early as 1882 he had conceived of the in situ or forward combustion technique, which proposes burning some of the oil sands to yield heat, which would reduce the viscosity of the surrounding bitumen such that it would flow to producing wells. This method, although now still being actively pursued in in situ pilot projects, is still far from being deemed as commercially viable.

One of the first men to use the hot water process and actually achieve commercial production was a Maritimer, R.C. Fitzsimmons. With just \$50 worth of material, Fitzsimmons built his own prototype version of an extraction plant. While the end product

wasn't completely free of clay particles and other foreign matter, it was suitable for the water-proofing of roofs and was sold for this purpose for a few years in western Canada. [71].

Originally, the Athabasca oil sands were owned by the Crown, or the federal government. An agreement was signed in December 1929 between the federal and provincial governments to transfer ownership to the province. Actual rights were obtained by Alberta as of August 1, 1930. Development of the tar sands continued to be spurred by the advent of the Second World War. Since Canada was hard pressed for oil, every possible source of petroleum was actively pursued; producing oil from the sands was viewed as an emergency project, but little became of it.

By 1950,

"the Alberta government concluded that commercial production of the Athabasca tar sands was economically feasible. But there was no great rush by oil companies to exploit the tar sands on the basis of the findings of a government study. The large fields of conventional oil then being discovered in Alberta offered far more economic and profitable sources of petroleum than those star-crossed tar sands. With a string of great discoveries like Leduc, Redwater, Bonnie Glen, and Wizard Lake, who needed the tar sands?" [72]."

Fitzsimmons, who emerged financially broken from his affair with the tar sands, attributed the disinterest of the majors a bit differently:

"You may find it hard to believe that the tar sands were purposely kept out of production unless you understand that the Major Oil Companies must have oil reserves so that they know thirty to fifty years ahead where their next source of supply is coming from. Consequently, they spend millions of dollars searching for new fields, but the tar sands was one source that they did not have to search for and they were determined to have that held in reserve until all oil recoverable from fields ran low, when they open up that area. Which, according to their plans, may be another twenty to thirty years [73]."

This passage was published in 1953. However much Fitzsimmons may have argued that the majors forced him out (an argument which Pratt also picked up to throw against the U.S. multinational oil companies), it would have been unthinkable from a corporate point of view, to have developed the high cost tar sands if lower, less technologically intensive, and more readily available oil sources were at hand. If Fitzsimmons had been president of Imperial Oil, Canada's largest oil company at the time, he would have undoubtedly come to the same conclusion.

During the period from 1948 to 1960, would-be producers realized that size was probably the most important consideration in the design of a successful commercial tar sands plant. In some cases the order of magnitude of production in the planning new plants was raised upwards of one hundred fold. In addition, commercial entrepreneurs realized that material handling problems had a far greater effect on successful operation than did any other technical factor [74]. Ells' prediction of the necessity of large scale plants was only acknowledged 40 years after him.

Fitzsimmons' plant, having undergone numerous refinancing arrangements and name changes, emerged into the 1960's with the name Great Canadian Oil Sands, now known as Suncor. Prior to the building of Suncor' plant, there were many attempts to produce

oil on a commercial basis, all of which were unsuccessful. In accordance with the learning curve phenomenon, however, each contributed to the accumulation of technical knowledge which is proving to be immensely valuable in present day plant design considerations.

In March of 1960, Suncor applied to the Alberta government for approval to build a commercial plant. The proposal was found deficient in a few technological respects, and pending their solution of those problems, approval was deferred. In May of 1962, and September of the same year, Syncrude and Alsands respectively followed with similar applications. A month after Alsands applied, Ernest C. Manning, Premier of Alberta, issued a Tar Sands Development Policy. It was the first time development of the tar sands would be subjected to not only economic, but also political considerations. As Ells had correctly foreseen, the timing and extent of production from the tar sands would be linked to conventional oil: synthetic crude was not to jeopardize the growth and vitality of the conventional oil industry (and hence, an important source of revenue for the government) by supplying even more feedstock in what was considered to be a limited market. As such, synthetic crude would be limited to 5% of total production. It was the government's stated policy that an opportunity would be provided for the "orderly development of the tar sands within the limits dictated by the government's responsibility to the public interest in preserving the stability of conventional oil development." Politically, it was the smartest thing Manning could have done, because both parties concerned (the conventional oil and unconventional oil industries) were recognized and given a slice of the pie. Whatever his shortcomings in limit-

ing the development of the tar sands during his tenure, Manning recognized that, unlike conventional oil, production from the tar sands could not be shut-in, and as a result, production could not be allocated and pro-rated: "Oil from the sands cannot be so prorated because a constant plant throughput is essential to make such development economically feasible [75]."

On the basis of this statement, founded as it was primarily on the displacement of and impact on conventional oil by synthetic crude, the applications for Alsands and Syncrude were designated "technically sound" by the Alberta government, but approval for the projects, however, was deferred until December of 1968. Suncor's bid was accepted almost solely on the grounds that its proposed plant capacity hovered just below the 5% of total production mark; Alsands and Syncrude were well above it. With the hindsight of Suncor's recurring technological problems, it was perhaps just as well that development was restrained to allow further progression along the learning curve.

Although this is just a glimpse of what happened, what is striking is the absence of large political problems (which the pioneers had to face). Rather, up until the 1960's, theirs was an environment in which the economics of the marketplace dictated the technological, geological and productive rates of development. Oil sand was used as a paving material, but was uneconomical in the end. The same is true of semi-processed bitumen used for roofing. Slowly but surely, it was recognized that only thoroughly processed and upgraded oil from the tar sands would be a marketable commodity. This implied having to develop the necessary technology to do it. And this implied overcoming the cost

disadvantages associated with the new technology. Developers of the tar sands are still faced with this problem.

Suncor.

In 1967, with a population of 5,000, Fort McMurray was hailed as the "oil capital of the world." The occasion was the opening of the Suncor plant, the first truly commercial synthetic crude oil operation in the world. That Suncor was the first is a very important point, and it will be referred to many times in the remainder of the paper.

Having granted Suncor preliminary approval in 1962 to commence production at 31,500 bbl/d by 1966, the Alberta government later revised this in 1964 to 45,000 bbl/d. Suncor chose Bechtel Canada as the engineering contractor. When the plant was finished and dedicated on September 25, 1967, the total cost had run to \$250 million. In 1979 dollars, this figure was closer to \$1 billion [76]. Located twenty miles northwest of Fort McMurray, the Suncor lease covered 4,000 acres. For its time, it was, as Pratt said, a sight to behold.

When the president and CEO of Sun Oil Inc., J. Howard Pew, decided to invest in the tar sands, the price for synthetic oil was the same as that for conventional oil. But, as is the case for other companies now intending to invest in the tar sands, and as Fitzsimmons prophetically noted, Sun was deficient in downstream operations. In other words, Sun did not have its own supplies of crude with which to run its refineries. It looked to the tar sands as the logical solution to that problem.

"Pew's goal was to protect Sun's oil supplies with the gigantic venture in syncrude. The 1964 project sank one-third of Sun's assets into Canada in the hope that Sun's pioneering technological abilities to squeeze the oil out of the sands would supply Sun's present and future refineries. The investment would be in place early, thus avoiding future inflation [77]."

It appeared as if supply of oil, even at a premium, was of primary concern. For Canadians, as I shall argue below, security of a long term supply of oil is still unimportant, even though now Canadians should have greater concern for security of supply than Pew did in the early sixties.

What, of course, Pew did not readily recognize was that the oil needed to be mined, and not drilled for. Therefore, the Sun oilmen would have to accustom themselves to a completely different concept of modus operandi of oil production than they had gained experienced with. Ice cold weather in particular posed barriers that were unexpected. Plant breakdowns, technological snags, and an oil price of \$2.50 when \$2.75 oil was needed for a profit kept the program in the red [78]. By September 1975, the accumulated loss had reached \$79 million [79]. The project was not abandoned by Pew and his successors, because, "profitability was always just in front of us." Price limits by the Canadian government were obviously not anticipated by Sun.

Nevertheless, 1975 was a break-even year for Suncor. With a higher operating efficiency as a result of experience, and bolstered by higher domestic prices, the accumulated loss shrank to \$41.1 million in September 1978, and to \$35.3 million three months later. Confident that its troubles were at least under control, Suncor applied for and received permission to expand its facilities to produce an additional 13,000 bbl/d of syncrude, at

a cost of \$185 million. The expansion entailed additional mining equipment to process more oil sand and renovation and expansion of the existing facilities to extract a higher yield from the sand. Financing of the expansion was somewhat more difficult than Suncor anticipated, since the \$334 million commitment by Sunoco had been used up by August 1975, and the parent company declined to invest further in the plant.

Suncor's significance and overall contribution to the development of the oil sands can be encapsulated in the following way: "The proof that such a wealth of natural resources can not be readily converted into a financial bonanza is evidenced by the trials and tribulations experienced by GCOS (Suncor) [80]." Other consortia, such as Syncrude and Alsands saw in Suncor an example that was not to be followed in many ways, because it was a money-losing operation. In part, Suncor's poor profitability must be attributed to the royalty and taxing agreements that were made with the provincial and federal governments. They were, in a word, punitive. According to May,

"If Ottawa were to treat the taxation of future investors in the oil sands in much the same manner as it treats GCOS, my results indicated how poorly private industry would fare. Under these circumstances, private investors would have absolutely no incentive to undertake further surface mining schemes [81]."

Indeed, as will be seen with Syncrude, the inimical example which both the federal and provincial governments set in their relationship with Suncor acted and continues to act as a constant reminder to project applicants in their negotiations with governments.

Syncrude.

When Syncrude applied for permission to construct and operate a 100,000 bbl/d oil sands plant in 1962, it did not realize that this was to become one of the most controversial of all projects ever built in the history of Canada.

Syncrude did not begin production until 1978. The Manning Government, having deferred approval for the project in 1963, once again addressed the need for the project vis-a-vis the conventional crude outlook when Syncrude reapplied in 1968. At this time, the Prudhoe Bay find was wreaking havoc with conventional crude reserves, and it appeared as if there was no shortage of conventional crude to justify building the Syncrude project, given the Alberta Oil Sands Development Policy (see Section 7.1). Approval was nonetheless granted with two attached provisos: the first limited the project's capacity, and the second determined its startup date. These were revised several times over the years as the need for new domestic supplies became evident, particularly after the international embargo.

The Syncrude controversy, a matter which Pratt has tried to bring to light, centers around the issue of the project's cost. Originally in 1963 at \$356 million, it was estimated to be proportionally less expensive than the Suncor project. This escalated to \$650-700 million, which raised some eyebrows. When soon thereafter the cost trebled again, one of the consortium's members, Atlantic Richfield, decided to withdraw its commitment to the project in late 1974, leaving a financial vacuum of a cool billion that had to be filled by the remaining consortium members if the project was to proceed. According to Syncrude's then

president, Frank K. Spragins, unless Syncrude made substantial progress payments to suppliers by February of 1975, renegotiation of purchase contracts would delay delivery of plant equipment for up to five years. The remaining members in the consortium were not willing to put up the additional financing unless they were guaranteed certain safety concessions from the provincial and federal governments. The alternative to the oil companies, which May suggests they were unlikely to follow due to the degree of sunk costs in the project, was to scuttle the project altogether. It was therefore obvious to the members of the consortium that they could use abandonment of the project to blackmail the governments into granting the maximum possible benefits, because they were aware that both governments desperately wanted to see the project realized.

Pratt's contention that the public figures were blackmailed by the oil industry was magnified by the fact that these were subsidiaries of U.S. based multinational oil companies, and that Canada was once again being sold out to its southern neighbors. Furthermore, Pratt argued, the tax and royalty schedules worked out in Winnipeg were such that the entire financial risk was being borne by the federal and provincial governments; the private industry members of the consortium had no incentive to make money from Syncrude, but rather were willing to assume even tax deductible losses -- their primary interest lay in nothing but the crude supply itself, which, in turn, Pratt felt was intended to be exported to the United States according to the contrived continentalist energy policy. The companies, so Pratt continued, had convinced Lougheed, the premier of Alberta, and to a certain extent Lougheed had convinced himself, that the Syncrude oil was

desperately needed. The consortium members went into the negotiations confident of the fact that they had the Alberta government under its belt, and that many of the financial risks could be unloaded onto their shoulders. (Other authors, such as J.D. House and James Laxer, concurred with Pratt, and pretty much adopted his arguments to fit the tone of their own work [82].)

In a Winnipeg hotel room Peter Lougheed, the province's energy minister, the federal energy minister Hon. Donald MacDonald, the federal finance minister Hon. John Turner, the premier of Ontario William Davis, and the Syncrude negotiating team worked out the Syncrude agreement in a single evening. Among other risk-reducing arrangements, the agreement stipulated that Syncrude would be guaranteed access to markets and to international prices, deductibility of provincial royalty payments from federal income taxes, and lastly a provision that entitled the Alberta government to 50% of the profits after all costs had been recovered. In addition, the governments of Canada, Alberta, and Ontario were to finance the project with \$300 million, \$200 million, and \$100 million respectively, for which they would receive a 15%, 10%, and 5% equity share of the project. The remaining members of the consortium would make up the balance of Atlantic's share, \$400 million. The final ownership shares would be: Imperial Oil, 31.25%; Canada Cities Service, 22%; Gulf Canada, 16.75%; Ottawa, 15%; Alberta, 10%; and Ontario, 5%.

While Pratt considers this agreement to be downright despicable [83], I offer an alternate explanation. The Syncrude members, faced as they were with almost overwhelming financial commitments, saw themselves in a similar situation to that of

Suncor. Suncor's operations were at the time still adding to the total accumulated deficit and the risks which they had faced were now looming before the eyes of the Syncrude men. It seems evident that Syncrude's bargaining position was a symptom of paranoia brought on in part by the technological risks involved in tar sands operations, but even more so by the punitive taxing arrangements that had formerly been agreed to with the province. Both these elements were reflected in Suncor's bottom line. The men of Syncrude were fiercely determined not to let history repeat itself.

Peter Foster, author of The Blue-Eyed Sheiks, a book about the Canadian oil establishment, offers his own version which strongly repudiates Pratt:

"The Winnipeg agreement caused an uproar from left-wing nationalists. In particular, Larry Pratt's book accused both sets of governments of being duped by multinational oil. The fact was, however, that the left wing was once again attributing far more Machiavellian intelligence to the big oil companies than they really deserved. Of course big oil was going to try to squeeze as many concessions out of government as it possibly could. To suggest otherwise would be naive. But having governments as partners also made the majors a little uneasy.

Pratt's assertion that Lougheed was acting in concert with the oil companies was perhaps the one that was widest of the mark. Lougheed and his advisors couldn't have played it tougher with Syncrude. Lougheed and Don Getty at one point sensed that the Syncrude participants were growing overconfident because they thought the province wanted the development at all costs. They decided to make it clear that the province didn't. The Syncrude group presented a set of demands that they indicated were their "final" position. Getty went to the meeting at which the demands were to be discussed and asked: "Is that your final position?". The companies said yes, whereupon Getty, to their astonishment, closed his books and got up to walk out. All of a sudden, panic seemed to break out among the company men. Brent Scott, a Gulf man destined to take over the presidency of Syncrude, grabbed Getty by the arm. Both are big men. There was a moment of tension. But then Scott let go and Getty left. "The whole climate of negotiations changed after that meeting," Getty told the author [84]."

Much of what Pratt argued was based on the microeconomic findings of Gerry May's econometric model. May's model, despite its macroeconomic weaknesses and inconsistencies, is very good at replicating the microeconomic implications of the Syncrude project. Specifically, having determined what were the effects which the royalty system had had on the totally privately funded Suncor project, he turned to the Syncrude project to determine much the same thing. He estimated that the per barrel capacity costs for Syncrude were \$16,000 as opposed to Suncor's \$15,600 (yet, elsewhere in his paper, he describes Syncrude's cost escalation as a "symptom of gross mismanagement" -- if he is not comparing this "gross mismanagement" to Suncor, to what then in ord-

er to substantiate such an accusation?) In terms of labor content, Syncrude employed 20 persons per thousand barrels of capacity, whereas Suncor employed 33. On the basis of these facts he concluded that "taking both capital and operating costs together, it would seem that Syncrude does enjoy the benefits of increasing returns to scale." How this supposed profitability translated into after tax revenue sharing between the private industry consortium members and the public consortium members was May's next step, and it is here that he accurately predicted the patterns of likely outcomes. Because some of his quantitative assumptions were wrong, principally regarding the real price of oil, the degree of these outcomes, however, was grossly underestimated.

For this part of the discussion I will turn to a paper written by May and his "mentor" [85] John Helliwell, which refined May's model from the one in his earlier paper [86]. They noted, as did Pratt, that tax deductible expenses incurred by Syncrude allowed the consortium or joint venture arrangement to reduce "the present value of tax payments by making tax deductions available sooner, to the extent that members of the consortium are themselves in taxable positions [87]." (This suggests that future oil sands projects will be directed by consortia not only for reasons of financial risk distribution, but also for tax minimizing purposes. This appears to be true: Alsands is a consortium, and all indications are that Imperial Oil is looking for partners in its Cold Lake venture.)

The paper further indicates that the "net effect of the Syncrude arrangements is to achieve a very substantial payment from the taxpayers of Canada to those of Alberta, with a lesser

transfer from the federal government to the private producers." Those participating members profiting (losing) from the Syncrude taxing scheme, therefore, were to consist of the following in order of magnitude: Alberta, the private producers, Ontario, and (Canada). The model assumed a given price for oil, which was assigned to the model as a variable. The model did not take into account and therefore underestimated the income accruing to the province from the utility plant servicing Syncrude and the pipeline that takes the syncrude from the plant gate to Edmonton. Using different pricing scenarios, the model then showed what options under the terms of the Winnipeg agreement the government of Alberta would exercise to maximise its revenues.

History shows that May and Helliwell were indeed correct, and Alberta did in fact do what they predicted. Alberta chose to follow those options which May and Helliwell indicated it would follow under the high oil price case, and it most certainly emerged by far as the most successful participant in Syncrude. But what is more important to note is May and Heliwell based their conclusions on an unrealistic oil price for synthetic crude. The curves, which show the present value of rents accruing to the participants under the tax scheme with Alberta's exercised options, show that as the price increases, the negative value of Ottawa's rents decreases. At a price of \$14.00/bbl., the present value to all participants is positive with the exception of the federal government. The margin, however, is decreasing, and there is no indication whatsoever of what Ottawa's rents would be if the price were at the present level of \$38.00, which is more than twice that calculated as a high case. The only main alteration which must be made to their conclusion is, that rather than mak-

ing a substantial payment to the taxpayers of Alberta, the government of Canada allowed a much smaller transfer of funds than May and Helliwell would have us believe, due in main part to the unforeseen rise in world oil prices, which Syncrude was guaranteed in the Winnipeg agreement. As a result, the following conclusion they drew up for future tar sands plants can also be thrown out the door: "For all their limitations, our results do seem to indicate that under present estimates of the costs of current mining and processing techniques, there is no resource value in the oil sands at current world prices."

What May, Helliwell and Pratt focus their critique on, however, is the lack of information on which the Ontario and federal governments based their decisions in the Winnipeg negotiation. The three accuse the federal government in particular (it was the one putting up the largest share of the three governments) of placing a high degree of reliance on a study which was conducted by the Alberta government. By so doing, and failing to conduct a study of their own, they contend, the federal government was "taken for a ride." They claim, furthermore, that it acted highly irresponsibly:

"It might be argued, in a conjectural way, that the great haste and realtive ignorance accompanying the federal government's decision to invest were jointly responsible for the results and that resource developments might better be left in the more knowledgeable hands of the provinces, given the relative success of Alberta at the bargaining table. It might also be argued that the magnitude of the transfer by secret bargaining requiring no prior public or parliamentary investigation or approval creates a dangerous precedent, one that is likely to be followed in the future if government participation in private ventures and special exemption from taxation are to become standard methods for the federal government to acquire a larger role in resource management [88]."

May warned less ironically in his paper that need of information in the future will be even more relevant, when the development of new domestic energy resources calls for ever increasing amounts of capital and labour and when the stakes are likely to become larger and the mistakes more costly.

These criticisms are certainly true, but are not as critical as they have been presented.

According to May, the only apparent solution which justified the federal government's position was based on the implicit future value of the tar sands.

"Rationalization of the project on the grounds that it would contribute to future development implies that the federal government, on behalf of society, expected the present value of such future benefits to exceed the federal government's losses incurred today. Any other explanation simply has no basis in sound investment decision-making."

In an interview with CBC talk show host Barbara Frum, Donald MacDonald, the federal energy minister acting on behalf of the government in Winnipeg confirmed this supposition, "If this (Syn-crude) project does not go ahead, then we will have lost an important option in our national energy policy." In economic terms, the government was faced with a tradeoff between greater security of supply, and returns sufficient to allow the companies to proceed with the project. MacDonald, as quoted in a journal from December 23, 1974, at the height of the crisis: "The government faces the hard question of whether large amounts of money should be invested in the tar sands or held for investment in other fields. I think there's a feeling that unless Syncrude goes ahead, there's little prospect for other plants." In an interview

with me, the former minister put it a bit more explicitly, "We knew we were being screwed in Syncrude." But he made it clear that he felt that he and finance minister Turner had acted in the national interest. When asked what prompted him to sympathize with Syncrude's tax and pricing conditions and to reverse his hard line policy of nondeductibility of provincial royalties from taxable income, and this in light of the fact that the Canadian government "knew it was getting screwed," Turner replied that the first and foremost objective of the federal government in the Syncrude negotiations was to initiate momentum towards self-sufficiency in oil. The secondary objective of the government was to provide the oil companies with a sufficient return on their money so that the necessary extraction technology could be continuously developed. The Syncrude deal was crucial to this momentum, as MacDonald outlined in his interview with Frum, because it offered long term supplies with exactly those advantages over other domestic alternatives that were explained and argued above (Section 6.5.2.2).

To say that Turner's and MacDonald's actions did not represent the position of the government is a contentious issue. As Turner put it, it was Syncrude or increased imports. "Which would you rather have?" Certainly, in light of the fact that without Syncrude, politicians in Winnipeg, or Ottawa, for that matter, would not have been in a better or more representative position to answer for the alternative, higher imports, and in light of the constrained conditions in which either situation presented itself, Turner's and MacDonald's representation was not at all a point of issue. The simple fact of the situation was that the government was very limited in its choice of alterna-

tives. Rather, the point was, if Syncrude, at what cost?

Pratt feels that Syncrude's costs were purposefully inflated, implying that they could be written off against future income (and therefore implying that there was no incentive to keep them down), and furthermore implying that Bechtel Canada (also the engineer for Syncrude), as a subsidiary of the world's largest engineering company which happened to be American, would be able to funnel the engineering funds downstream to its American parent. The grand scheme, as Pratt visualized it, was that the costs were artificially inflated so that they could be written off against taxable income. That way, the public sector would be deprived of its income, and the subsidiaries of the American multinationals would have long term supplies of oil that they could export without having incurred any great cost. Again, Pratt was predicting the outcome of the race before the horses had even reached the quarter mile pole. Of the more than \$2 billion spent on construction 80% was spent in Canada on materials, payrolls, equipment and consulting services. More than 67% of the project, moreover, was engineered in Canada [89]. The approximate breakdown of expenditures ran 58% in Alberta, 16% in Ontario, 6% in other parts of Canada, and 20% abroad. Recent statistics indicate that 74% of the Syncrude work force and 90% of Canadian Bechtel workers and subcontractors are Albertans, while 23% of Syncrude workers and 3% of Bechtel workers are from other parts of Canada. Non-Canadians working with Syncrude total 3%; with Bechtel and its subcontractors, this figure reads 7% [90]. It is approximated that 10,000 people were employed across Canada in work which was directly related to the project.

Tudor Williams, the public affairs spokesman for Syncrude Canada, who happened to know Pratt, drew attention to two little known facts, in explaining the cause of the rapid "grossly mismanaged" cost escalation. Syncrude was both proposed and constructed during a time of high inflation. This alone does not explain the doubling and trebling of costs. Rather, as the planning stages were nearing conclusion, the engineering cost estimates were rapidly moving upwards from a Class 5 to a Class 3 level (1 being the most precise), and the degree of probability that cost estimate was the actual cost rose correspondingly. That is, the Class 5 estimate carried a plus-minus factor of perhaps 300%, whereas the Class 3 only 100%, and so on. Syncrude actually came in under the final estimate, which was drafted during the time of the Winnipeg agreement, by several million dollars, Williams said. He also mentioned, grinning in a curious way, that Pratt perhaps had not bothered to pursue some of the things he had said in his book as the developments with Syncrude continued, suggesting that Pratt realized he had been wrong on several counts, and that he was avoiding having to make a face-losing retraction.

In a totally unrelated project undertaken by Harvard University, the cost estimates underwent a similar pattern [91]. While the degree of engineering complexity was nowhere near that demanded by the tar sands, Harvard's diesel co-generation plant was originally estimated at \$50 million. Within six years this had ballooned to \$230 million. Furthermore, a Syncrude-sized tar sands project announced in 1980 by Petro-Canada and Alberta Gas Trunk Line, both wholly Canadian-owned companies without any affiliation to American-based multinational oil companies, and therefore without a vested interest in repatriating profits to

the United States or elsewhere, will cost an estimated \$10 billion. This is the largest and most ambitious undertaking (in terms of cost) ever planned in Canada. The onus is on Pratt to prove any malevolent motivation for the dramatic cost escalation of either the Harvard or Petro-Canada projects. Mr. Williams' explanation appears quite acceptable enough. Pratt's worries that large sums of Syncrude money would flow out of the country, and that the Canadian element of participation in the project wasn't maximised, can now be laid to rest.

Ontario's role in Syncrude is hard to understand. According to May's model, Ontario's net economic gain was in many ways close to that of the private producers. The best explanation May could offer was that Ontario entered Syncrude because it "believed that synthetic oil would soon be essential to meet the province's expected demands, or, more plausibly, it anticipated some long-awaited price and tax concessions from Alberta and Ottawa in return for its assistance in the Syncrude crisis." More likely, however, judging by its interest in Syncrude, Ontario (foolishly) considered its participation in Syncrude a short-term, high-yielding investment. Ontario sold its 5% equity share, held by the Ontario Energy Corporation, for which it had spent \$100 million, to PanCanadian Petroleum for \$160 million. Although the greatest single user of energy in the nation, the provincial government of Ontario did not consider it important enough to maintain an interest in its future energy supply. That Ontario will receive tax concessions or favors from either Alberta or the federal government because it assisted in the Syncrude crisis is now highly dubious.

Ownership changes among Syncrude participants have been numerous. The federal government authorised its share to the state-owned oil company, Petro-Canada. Similarly, the Alberta government gave its share to the Alberta Energy Company, a corporate entity which is half publicly and half privately owned, so that the people could more directly receive the benefits of Syncrude. The province of Alberta also exercised an option to expand its equity interest in Syncrude, whereafter it immediately sold part of its increased share to Petrofina of Canada and the Hudson's Bay Oil and Gas Company at very lucrative terms. Many private companies, by offering to pay high prices for a piece of the Syncrude action, appear to see something profitable or desirable in Syncrude which the Ontario government did not.

The Syncrude operation must be considered a success. As early as 1977, before construction had even been completed, the consortium contemplated expanding the facility. It now appears imminent. Plans call for a fifth production train that will allow an additional 70,000 bbl/d to be processed. The cost in inflated dollars will now be greater than the cost of the original project, expected to be above \$2 billion. Technical problems, such as the recent explosion of two compressors used in the hydro-treating process, are not at all reflective of the fundamental design of the facility.

There can be no question that Syncrude, like Suncor, played an integral role in the continuing commercial development of the tar sands. The above discussion, however, would seem to suggest that in future negotiations with Alsands and Cold Lake and their successors, the Albertan government will have to mollify its lu-

crative position on its share of royalties and or profits from these projects, and that this share should tend towards the federal government in return for its providing a critical impetus or subsidy to the tar sands as a whole.

Nevertheless, perhaps the most important lesson of the Syncrude drama is that, as each successive project approaches the decision point to go ahead or not, the three actors that collectively decide the ultimate fate of a project (the oil company members, and both levels of government) should be aware of the fact that each of the three will review his former negotiating position and will adjust it in such a way as to necessarily improve it. Each of the three deciding members should be prepared to allow a more equitable distribution of the benefits according to each party's contribution, both past and present. It would be unlikely to assume, for example, that the federal government would allow itself to be "screwed" again. It will be the disproportionately large chunk of the pie Alberta received in the Syncrude deal that Ottawa will want.

To conclude, Syncrude was a highly controversial project. Predictions that its operation would be marginal were disproved, as the costs of production rose less quickly than the price received for the product. The future of the project, decided in the space of a single night, was secured in the national interest at what appeared to be a large expense for the Canadian taxpayer; circumstances showed, however, that the expense was far less than anticipated. The benefits of Syncrude (an additional long term supply of oil and a high Canadian content of material and labor providing a substantial financial multiplier effect) are enjoyed

by all Canadians, albeit at an avoidably higher price. While it is not known whether the increased cost is warranted at the present, the lifetime of the project, with its improved technology, its freedom from frequent technological breakdowns characteristic of the first generation plant, and its intangible impetus to tar sands development, will allow this higher cost to be amortized over a very long period indeed.

Alsands

Not following the lead of Syncrude, Alsands decided in 1968 to postpone its reapplication for project approval from the Alberta government. In 1973 Shell Canada reapplied in conjunction with its American subsidiary Shell Explorer. A year later, citing rising costs and uncertainty over the government's energy policies, Shell Explorer withdrew, and the project was once again temporarily shelved. According to the "Financial Post," however, in the aftermath of the OPEC crisis, it was the almost certainty that synthetic oil would not be assured for export to the United States that brought about Shell Explorer's pullout [92]. While this lent support to Pratt's continentalist energy policy theory then, the fact that the project has been revived with Shell Canada Resources and Shell Explorer as the two largest participants negates that theory now.

According to Foster, Shell Canada is described as "gas-rich and oil poor." Motivated by having been "deeply disappointed by its lack of success in exploring Canada's frontiers", and having historically had a corporate strategy that entailed zeroing "in on major targets with its full resources," Shell, "with typical thoroughness," turned to the tar sands [93]. It is by far the

largest undertaking ever in the company's history. Like Sun, Shell is virtually risking its financial future on the commercial viability of the Alsands project to ensure a long term supply of oil for the rest of its integrated company.

(Shell has perhaps gone farther than most other companies in its plans for the tar sands. Foster hit the nail on the head when he said that Shell completely focused its efforts on reaching corporate targets in a major way. In the late months of 1979, probably after Foster's final draft went to his editors, Shell Canada announced it would build a refinery in Edmonton designed specifically to handle synthetic crude. At a cost of \$350 million, it would have an initial throughput capacity of 44,000 bbl/d, eventually expanding up to 68,000 bbl/d, producing middle to light distillates exclusively, such as motor gasoline, stove oil, diesel oil and jet fuel. [94]. What is remarkable about this announcement is that the refinery will be a tangible example of the birth of a new specialized industry, and more importantly, that it will use the synthetic crude in the most efficient way possible; that is, it will produce products from synthetic crude that will most likely continue to be the fuels for those applications for which there is the least possibility of fuel substitution. At the present, refinery capacity in Canada is sorely underutilized, and the yields in terms of the desirable distillates are still mainly those of first to second generation refineries, that is, there is still considerable room for yield improvement. By strategically planning the construction of this refinery, however, Shell is initiating a trend that will most certainly have to continue, a trend for which it hopes it will achieve a competitive advantage over its competitors. Although Shell will be

a pioneer in the refining of synthetic crude like Suncor was in production of synthetic crude, Shell is unlikely to encounter any difficulties such as Suncor, and its planned refinery is a sure bet. So much so, perhaps, that the birth of a new integrated industry-within-an-industry for synthetic crude will lead to a new phase of economic growth in general.)

Following the path set by Syncrude, the original price tag in 1962 for Alsands was set at \$260 million. By the time the AERCB approved the project, in July 1979, it stood just shy of \$5 billion. The latest available estimate, as of the end of November, 1980, has it at \$8 billion. The reasons for this escalation, indeed rocketing would be a better word, have already been explained. The repetition of evidence is merely intended to reinforce those contentions.

An examination of the consortium members' participation reveals a number of names, especially among those holding smaller equity percentages, that in all probability look towards these projects as stepping stones to heading their own projects. This is particularly true of Petro-Canada. Shell Canada and Shell Explorer hold 25% and 20% respectively, with Amoco of Canada (10%), Petro-Canada (9%), Gulf Canada (8%), Chevron of Canada (8%), Petrofina (8% -- soon to be owned by Petro-Canada), Hudson's Bay Oil and Gas (8%), and Dome Petroleum (4%) making up the rest. Dome's participation in the Alsands consortium can be likened more to a beginning towards diversification away from high-risk frontier plays. What makes Alsands different from Syncrude, of course, is the absence of direct government participation. Petro-Canada was not given a share in Alsands, but rather, it

chose to enter the project in much the same investment capacity as the other companies. There is little doubt that its equity share could have been filled just as easily by another company, dispelling the thought that government participation was needed.

Three engineering companies, Bechtel Canada, by now a familiar name in tar sands development, Monenco Ltd. of Calgary, and Loram International of Calgary, have been selected to design and construct the close to 140,000 bbl/d plant, which it is hoped will be erected by 1987 or early 1988. As with Syncrude, they have been instructed to maximise their purchases and manpower requirements from Canadian sources. Preliminary site work commenced in December, 1979.

In concept the Alsands project will mirror Syncrude almost exactly. Mining will be by electric draglines, the extraction process will be the Clark hot water method, and upgrading will involve fluid coking. What differentiates Alsands from Syncrude is its intent to manufacture hydrogen from the gasification of residue coke, which will then be used for bitumen upgrading. The AERCB saw this as "a major step toward substantial energy self-sufficiency of oil sands projects." The high degree of duplication of the Syncrude process, however, and the proposal to construct a new supporting town are seen as the most problematic areas of Alsands by the AERCB. The lack of technical progress made by Alsands, despite the improved extraction efficiency, frustrated the Board, and its approval for Alsands was grudgingly and conditionally granted in view of the impending need for oil.

"The Board regrets that the applicant finds it still necessary to fall back on the Clark process in much the same form in which it began to be commercially operated 13 years ago. In the Board's view, operators contemplating bitumen resource developments have a clear responsibility to go beyond merely reviewing the current status of process technology and actively participate in research leading to improvements. The applicant's contention that research commitments cannot be made before project approval is given by regulatory agencies is wholly untenable.

However, faced with circumstances as they now are, the Board is prepared to accept continued use of the Clark process, and considers the overall recovery...acceptable. However, it expects the applicant to conduct extensive research and development, before plant start-up, with a view to reducing both naphtha and bitumen losses, and to keep the Board fully informed of progress [95]."

In addition, the Board required Alsands to relocate its plant site so as to decrease the amount of sterilized reserves, as well as to relocate the tailings pond in order to diminish the possible environmental hazard it posed along a planned utility corridor.

Alsands has taken a novel approach in its application to the AERCB. Rather than financing extensive "up front" R&D for the project, Alsands will avoid the risk of rejection by the Board and the loss of those development funds. But it promises to spend them if granted approval. Pratt might consider such a move an underhanded attempt by Alsands to minimize its commitment to the orderly and efficient development of the sands. In fact, however, the jurisdiction vested in the Board is ample to supervise Alsands and to ensure that their proposals are actually carried through. This, then, aside from the advantage of committing less capital, can be interpreted as a zero sum tactic on the part of Alsands.

At present Alsands, having received AERCB approval, is awaiting the approval of the Alberta Cabinet before proceeding.

Cold Lake.

Why is Canada's largest oil company, Imperial Oil, embarking on a high risk venture such as Cold Lake, where unproven techniques, technology and billions of dollars are at stake? According to Foster, the Cold Lake project is considered to be "by far the most expensive project of its kind ever undertaken in the world." The answer: "Imperial had funds flowing out of its ears from its massive Albertan production. It still produced almost twice as much oil as anyone else in the province, but had a sore lack of drilling prospects...Imperial seemed almost desperate to reestablish itself in the West in a big way [96]." Shades of Fitzsimmons' predictions were coming true almost to the year when Cold Lake announced its project in 1979. At stake was the number one position in the industry for Imperial for want of crude with which to feed the downstream operations; Imperial decided to go at it with everything they had.

The Cold Lake project proposed by Imperial Oil is different from any other project of commercial size. The oil located in the region is not exactly like the tar sands found in the Athabasca deposit, but it is nevertheless close enough in composition to fall under the government's definition of tar sands and to qualify it as such for taxing and other legislative purposes.

The process involves recovering heavy oil from reservoirs by in situ steam simulation, with subsequent fluid pumping. This is also known as the huff-and-puff method, whereby steam is injected

into the formation through special injection wells for a period of about 60 days. This heats up the oil in the reservoir, and reduces its viscosity, allowing it to flow to producing wells, which will pump the oil to the surface for a period of about 150 days. Successful managing of the Cold Lake project and its huff-and-puff method may be followed by a "patterned steam" drive, which is a dynamic process involving continuous steam injection and simultaneous oil production [97]. Cold Lake-produced bitumen will still have to be hydrotreated and upgraded so as to reduce sulfur and aromatics content. Like its mining project brothers, the result will be a premium quality crude.

The concept is simple. The realization is not.

"Injection rate and pattern spacing (of the wells) are the two principal variables in the steam drive process that must be taken into account in order to combine optimum economic results and sound conservation practices. One of the most significant factors affecting the overall economic efficiency of this process is the quantity of heat lost to the underlying and overlying formations. As the heat loss increases, the greater is the fraction of the produced oil that must be used as a fuel for heating the injected fluids (i.e. the thermal ratio declines). The heat loss can be reduced by heating the oil bearing sand more rapidly, by injecting steam at higher rates and by decreasing well spacing. However, as injection rate and well density are increased, capital costs for surface and subsurface facilities increase rapidly [98]."

These tradeoffs, and a myriad of others, must be addressed by a prospective producer with respect to the particular geological structure of his lease. In the Cold Lake case, "cluster" drilling, a concept employed in the North Sea, was adapted and applied. Cluster, or directional drilling, is both economically and environmentally attractive; it allows the drilling of several wells from a centralized area above the surface, with the wells dispersing radially outwards like a flower underground. The ad-

vantage is a more than 40% saving in overburden destruction over the conventional form of well spacing. In an area that will eventually cover half the equivalent size of the city of Edmonton, or 140 square kilometers, or three times the amount used by a comparably sized mining project, that saving is substantial. In the first year of production, 1,400 producing wells will be drilled, with an additional 320 new wells per year to offset the decline in production from the old ones.

Another identified problem will be that of water usage. The Cold Lake bitumen to steam ratio is estimated at .3/1. This implies that massive amounts of water, on the order of 4 barrels of water (after recycling) per barrel of oil produced, will be necessary. At a daily production rate of 140,000 barrels of 32 degree API oil, there is considerable cause for concern that water usage will be excessive enough to have negative environmental effects.

The AERCB placed restrictions on the project that forced it to develop an alternate source of water other than drawing it from Cold Lake itself. As an input or make-up fuel used to generate the steam, furthermore, the Board required that rather than oil or natural gas, Imperial would have to use coal. The negative impact of this decision was absorbed by the fact that Imperial owned substantial coal reserves, albeit located some 200 miles from the Cold Lake project. The necessary infrastructure to bring the coal to the project, which will probably be a slurry line, raised the price of the project by half a billion dollars. Regulatory burden may therefore be added to the list of inflationary factors that result in dramatic cost escalations for tar sands

plants.

Begun in 1964 as a pilot plant, Cold Lake now has 500 employees. The total costs incurred by Imperial for the pilot plant total \$180 million, and rise at a monthly rate of \$7 million. On the commercial plant, Imperial has spent upwards of \$150 million for preparatory expenses. Compared to the total cost of upwards of \$8 billion, this is still not an amount significant enough for Imperial to consider itself firmly committed to the project.

Some might want to argue that, considering other field in situ projects had attained a recovery rate of 50-70% of the in place oil, [99] Imperial's estimate of 20% is unacceptably low, and the project should continue for an indefinite period of time in the pilot stage until it reaches a comparable extraction rate. My argument to this has already been extensively presented above in Section 6.5.2.3.

Imperial has chosen a joint venture approach to the engineering, accepting bids from five companies, four of which are Canadian. Over the life of the project, it is estimated that 80,000 valves and 10,000 pumps will be required, most of which will be supplied by Canadian manufacturers. Put into perspective, this number of pumps is approximately equal to the total number already existing in Canada. Ted Courtnage, project executive for Cold Lake, supported the theory that the domestic economy would benefit, both from an endogenous and exogenous point of view:

"The project will help build the supply system in the country, so as to establish the capability not only to do projects of this kind in Canada, but also to provide the mechanism for export outside the country of technology, skills and goods. It goes far beyond our borders in the long term [100]."

Much like Alsands, Imperial intends to finance its share of the project from retained earnings and public borrowing. It does not intend to seek government aid in financing. No indication has been given by Imperial as to who has approached them, and much less who is interested in participating in the planned consortium, but according to Foster, partners will take up to 50% of the equity financing [101].

Cold Lake may have preceded Alsands in gaining project approval from the AERCB, but now finds itself waiting alongside Alsands for final approval from the Alberta government.

8. Elections '79 and '80

Enter politics.

The influence federal politics has exerted on the development of the tar sands in the past two years has been indirect, but more powerful than at any other point in Canadian history. This influence has seen a clashing of political ideologies, and a series of confrontations between the characters who espouse those ideologies. Over the course of these two years no clear winner or dominating force has emerged, and a lack of political cohesiveness together with an absence of willingness to find a common ground for compromise has left the nation fogbound with respect to the future situation of energy, and particularly oil.

The central figure in federal Canadian politics has been Pierre Elliott Trudeau. Since 1968 Trudeau has flirted with the country as he has flirted with actresses, noblewomen, and a brief, highly publicized marriage. His success in domestic politics has earned him the dubious and unofficial title of senior statesman among OECD leaders, and with the exception of a few heads of state, he has enjoyed a longevity in office unparalleled by any Western leaders.

Trudeau entered the 1979 election campaign with the spectre of the Quebec referendum predominantly on his mind. The issue of separatism so obsessed him because it contradicted his vehement attitude towards federalism and it essentially had the potential to destroy his brainchild of bilingualism which he had nursed since he came to office in 1968. By concentrating on this one issue, Trudeau missed the boat, and was caught unaware of what the

voters perceived were the most vital issues of the day. They were unquestionably concerned with the economy.

The victory of the Parti Quebecois in 1976 roused a patriotic sentimentality which Canada had not seen since the Centennial celebration of Canadian Confederation in 1967. But like Expo, it waned after a year or two, as Premier Rene Levesque managed to postpone the referendum year after year. Concurrently, the economy took on an increasingly important political role with the electorate.

Why did Trudeau call an election? Richard Gwyn wrote a most fascinating study of the Trudeau character. Gwyn maintains that following his separation from his wife Margaret, Trudeau read an article in which Margaret was asked who was most likely to succeed Trudeau as leader of the Liberal Party -- MacDonald or Turner? This apparently provoked him into calling an election several months ahead of the time his advisors had indicated the likelihood of his reelection would be greatest. Trudeau's vanity had been piqued. He would win the election, as one of them said, "to show Margaret."

Gwyn states that there is little that is more disturbing to the Trudeau ego, having been in power for over a decade, than something that he cannot exert control over. For the election campaign Trudeau focused his attention on the separatist issue. He would compete against Rene Levesque for the hearts and minds of their common support, the Quebec people. Trudeau interpreted Quebec's mandate to Levesque as a defection of support for himself, and as a denouncement of his bilingual program as a failure. What Trudeau believed the people of Quebec saw in Levesque was a

man who could pronounce and preserve the Quebec mentality and culture as an autonomous entity. As Margaret had been able to free herself from him, so had the Quebec people freed themselves from him as well. By winning the election, he would "show" them both. He would prove his virility.

Joe Clark, the new young leader of the Opposition and the Progressive Conservative Party, was not the ideal replacement to the people, but he would fill the void. By campaigning vigorously against the poor economic performance of the Trudeau Administration, both present and previous, by emphasizing the hypocritical nature of that administration's economic platforms and their actual policies, and by carefully avoiding an entrenched position on the Quebec issue, Clark was able to disenchant the English speaking people enough to persuade them to vote for him. West of Quebec, the majority of Canadians had adopted a wait-and-see approach to Quebec separatism; polls increasingly indicated that the extent to which the Parti Quebecois had campaigned for separatism was in fact not the extent Francophones were still willing to accept, i.e. Quebecers wanted less separation than what Levesque was willing to offer them two years previously. Separatism had faded into that by now catch-all phrase of sovereignty-association. With the major threat having passed, Anglophones turned to the "foundered" economy. Indeed, "Trudeau accomplished less during the last eighteen months of his third term in office than any other post-war Prime Minister. From the autumn of 1977 to his defeat in 1979, much of the little he did do was destructive."

Parliamentary politics, much like that in any democratic

system, places a great deal of confidence in leader figures. In Canada, Trudeaumania and the zest for oratory and flair essentially wowed people. The humdrum dry flavor of Robert Stanfield's style, by comparison, was no match in the early 1970's for the Liberal leader, and Clark's image as his successor had not been presented much differently. For the Tories, however, in 1979, this was just as well. Eleven years of Trudeau had taught the people of Canada how the tools of lapel roses and carnations functioned on the economy and on federal-provincial relations. In Gwyn's book, MacDonald described the Liberal government as "stale" and "out of ideas". Another senior ex-minister loyal to Trudeau said, "For the last couple of years, Trudeau and the government were out of control." Not only government figures, but also the electorate perceived this. The dollar was sinking to U.S.\$.85, unemployment had reached a post-Depression high of 8.6%, the balance of payments deficit stood at \$5 billion, and the government's budget deficit stood at \$11.5 billion, representing a-hard-to-swallow 25% of the government's total revenues. 1979 was clearly a time for a change.

If one believes in Tufte's model, wherein politicians are rewarded with reelection by the electorate for economic policy-making that results in positive economic performance, and punished for policies that have negative impact, the results of the 1979 Canadian election can hardly be considered a surprise. When the votes were in, Quebec was seen to have remained loyal to the Liberal camp, but Ontario had defected. It is quite fair to say that voters went to the polls not with the intent of voting for Clark so much as with the intent of voting against Trudeau. Therefore, the election outcome cannot be considered a Conserva-

tive victory as much as a Liberal loss. Not unexpectedly, the Tories completely swept the West (Trudeau had worked at alienating himself from the interests of the West in his policy-making during the 1970's), dominated Ontario in the key swing ridings, and fared sufficiently well in the Maritimes. The Liberals emerged from the 1979 election with a disproportionate number of its seats derived from Quebec, in excess of 70 of its total 114 seats, such that it was more a provincial party than a national one. National representation likewise eluded the Tories, however, as they failed to get more than a handful of seats in Quebec. The House took on the precarious characteristics of the Conservatives, on the one side representing English speaking people and the Liberals, on the other, representing only the French speaking people of Canada. Regionalism had manifested itself to an extreme in national politics. In the end, however, the coalitions that were formed were crossed regionally, with the Conservatives teaming up with the Creditistes, all of whom were from Quebec, and the Liberals with the New Democrats, who were virtually shut out from Quebec. The combined strength of the NDP (27 seats) and the Liberals equalled the combined strength of the Social Credit members (5 seats) and the Conservatives (136). The NDP-Liberal coalition was less tenuous, however, in terms of ideology and past situations where the two had joined forces, than that of the Tories and the Creditistes. A Conservative government, voted into office by a disgruntled Ontario electorate whom economic downswings had affected most, had been given a limited minority mandate. The elbow room with which the Conservative government could look forward to was very cramped indeed.

The presentation of the government's budget is a heralded affair wherein the elected government's platforms take on numerical and fiscal reality. Besides being the first significant piece of legislation put before the new session of the House of Commons, the budget is the make-or-break program that will likely be the determining factor in the government's hopes for reelection.

Finance Minister John Crosbie's budget was true to the blue. The single most significant part of the budget, both for the development of the tar sands and the public alike, was the price of oil, specifically the price of gasoline, to which the largest proportion of refined oil is designated in Canada. Gasoline price increases are also the most visible form of oil price increases to the consumer as he ritually empties his wallet twice a week to feed his creature, the automobile. The banner headline the following morning (December 12) in the Toronto Globe and Mail, Canada's homemade edition of a quasi national newspaper much like the New York Times, simply read "Gasoline Increased Four Cents a Litre". Elsewhere in the paper, a writer commented on Crosbie's assessment of his own work: "Mr. Crosbie was understating the case when he said it (the budget) was "risking some unpopularity.""

From a strategic point of view, considering their delicate minority position, the budget's proponents were definitely employing brinkmanship tactics. The Tories strongly believed that the public understood the need for higher prices, so that self-sufficiency in oil by 1990 would not become as farcical an idea as Trudeau's call had been when in 1974, in the aftermath of the OPEC crisis he vowed self-sufficiency by 1980. If the budget

passed what would surely be a non-confidence vote, the Conservatives thought, it will have cleared the first and largest hurdle they would likely ever encounter. The Liberals and New Democrats, of course, jumped on the budget like vicious wolves, denouncing it for its disastrous economic implications and conjuring visions of a second Depression. A price increase for gasoline was necessary, yes, but NOT an immediate increase of 18 cents per gallon, they argued.

When the bill came before the House for passage, it was clear that the Conservatives were missing key support from a number of sources. The Gallup poll reported the monthly popularity of the parties in early December with the Liberals ahead of the Tories by a 47-28% margin. The electorate's skepticism of the Tories' ability to govern effectively was beginning to emerge. By the time of the vote, moreover, two Conservative backbenchers were absent: one sick and the other on vacation, and a third Minister was travelling abroad. The day of the vote, the Creditistes indicated that they would definitely not support the government. As Gwyn dramatically described the event: "Later, when reporters cornered (House Leader) Baker to tell him that the Creditistes have now declared definitely that they will not vote for the government, his face turns ashen. "Well then, gentlemen," he says, "welcome to an interesting evening." The Conservatives lost the vote, called a "game of Parliamentary chicken," 139-133. Less than seven months after being voted into office, the Conservatives were checking out. It was the shortest period of time any government in the history of Canada had ever remained in power.

February 18, 1980: The Two Cent Election

An election was set for the middle of February 1980, an undesirable time for climatic reasons. The government's poor showing in the December poll was foreboding. Nevertheless, the Conservatives were firmly convinced of the need for a gasoline price increase, and the budget, as it was presented in the House, was adopted as the party's election platform. Moreover, the Conservatives had not been given a fair chance to govern. Their policies required time to work effectively, they argued. Self-sufficiency could not be achieved overnight. The Conservatives hoped to create an economic environment amenable to the oil industry, to which they looked to lead the country towards oil self-sufficiency. The estimated revenues under the government's entire energy package would amount to \$90 billion. The industry's share would be \$33 billion (37%), the provincial share \$40 billion (44%), and the federal share \$17 billion, or 19%, up from the previous 11% [102]. Revenues from the tax package "would be used entirely to finance a variety of initiatives to promote self-sufficiency in energy through direct support to conservation, substitution and new oil supplies." It was, all told, fresh, dynamic and different from past budgets. An editorial in the Globe shortly after the election evaluated Crosbie's program:

"It did what the Liberals had never done; it faced the very big and dangerous economic problems which threaten to topple Canada into a Depression, and did it courageously.

"Eleven years of Trudeau government had left Canada with high inflation, enormous budget deficits, vastly increased public debt, record post-thirties employment, the biggest deficits ever in international trade in goods and services, high interest rates, and a dollar that had (by now) dropped below 84 cents. We had also been left dangerously dependent on foreign oil, which is costly and unreliable, when Canada could have developed its own resources to become self-sufficient."

Clark's rallying cry for Canadian energy self-sufficiency was, "Mr. Trudeau thinks we should rely on Venezuela or Mexico. I say Canada should rely on Canada." All this notwithstanding, the Conservatives were "forced into the politically uncomfortable position of proposing higher taxes now to achieve a goal which, however necessary, could not be reached for ten years, if at all [103].

The February 2, 1980 edition of the Financial Post headlined the central issue of the campaign debate as "Oil Politics Put Pricing Up for Grabs." So, in fact, it was. And it centered around the price of gasoline. To the public in Ontario, the Tory proposal to raise prices by 18 cents was perceived as a program that would allow too many dollars to flow into Mr. Lougheed's Heritage Fund and not enough into Ottawa's energy bank. Trudeau was aware of this and capitalized on it for all it was worth. A price increase, he promised, would be less under the Liberals than under the Tories. He also proposed an oil price which the Post described as "suspiciously similar to old Liberal proposals from the mid-1970's, Ontario Premier William Davis's "blended" oil price, and some policies already being pushed by the Conservatives." The Post concluded: "Despite Trudeau's energy state-

ment, the voter still knows almost nothing about what the Liberals, in power, might do on energy pricing, a critical issue in the campaign." All the voter knew, specifically, was that the price of gasoline would be less than under the Tories. This point is very, very important to keep in mind. By comparison, said the Post, "the Conservatives have spelled out clearly -- and probably to their great disadvantage -- the scenario for future price increases over the next three years." The Globe concurred:

"The Government of Prime Minister Joe Clark has told the people what its policy would be which the Liberals have carefully avoided doing.

Mr. Trudeau ignored persistent pleas from reporters to translate his own policy into dollars and cents, firmly insisting that a reasonable price would be negotiated between a new Liberal government and the producing provinces [104]."

In a full page advertisement taken out in the Globe, the Liberal Party platform on energy was nebulously spelled out. The Liberals, it said, favored a "Made-in-Canada blended oil price," "flatly rejected the 18 cent/gallon gasoline excise tax," looked to directing the benefits of the \$100 billion boom needed for future energy projects to Canadians, and recognized the potential for "Canadian firms to become world leaders in particular skills and technology."

There was no avoiding it. The Conservative platform was fatal, particularly to the people of Ontario. The romance with the Conservatives was called off once it was realized that the reward for having voted them into office was legislation requiring the very people who had elected them, to pay more. No one wanted to pay more. Who does? Whatever the economic merits of the Conservative program, "it hung like a millstone around the necks of Con-

servative candidates across Canada. [105]."

According to Gwyn,

"Trudeau's most considerable political gift, his magical allure aside, is that he lives wholly in the now. It is the reason why he has been able to re-write the rule that intellectuals make lousy politicians. In the way of all successful executives, he wastes no time and energy either in sentimental wishful thinking about the past as it might have been, or about the future as it might be. He is an existential politician."

Trudeau's recognition of the fact that gasoline prices was the only salient, "now" issue won him the election in 1980. The voters, he knew, being himself so very much a "now" person, did not want to be told that energy was going to cost more now, only that it would cost more later. When wasn't important. What was politically expedient was to tell them that it would be less than they had been expecting and fearing. With a message that had a saviour-like tone to it, delivered with that rejuvenated and rhetorical Trudeau flair with which Canada had come to develop a love-hate relationship, Canada was seduced again.

As Ontario had given birth to the Tory Government, so Ontario ended it. Consumers in Ontario drifted back to the Liberals, as did the fisherman in the East. In the West, farmers defected to the New Democrats. The common elements that bound these people together in political affiliation against the Conservatives were their high usage of fuel and their distaste for swallowing the supposed bitter medicine of higher energy prices. The Liberals were returned with a solid majority. They gained 38 seats, finishing up with 148 to the Conservatives' 101. Trudeau was back.

By abstaining from the December nonconfidence vote on the budget, the Social Credit Party committed political suicide. Having failed to win a single seat in Quebec, probably because they had aligned themselves with the Conservatives when they had been in Parliament, the Creditistes were declared extinct. It is hard to believe that they did not realize they would imperil their own future (by abstaining) more than the Conservatives would (by presenting the budget in the first place). Given the critical nature of this parliamentary alliance, the Conservatives' livelihood was a benchmark for the survival of the Creditistes themselves.

As for Trudeau, he must either be congratulated for political genius in telling the people what they wanted to hear, rather than telling them what was good for them, or he must be denounced for deceiving the public. At least one publication [106] takes the latter view: "When Canadians returned Pierre Elliott Trudeau to power last winter, they demonstrated a political will that bordered on the masochistic." Certainly Canadians had once again invited into their houses the man who was famous for fuddle-duddle, flip-flops and flimflammy. There was no indication on his part that this would not continue. Every shred of evidence pointed to the likelihood that it would. Nor did the evidence lie. It did not take long. His ego reinforced by what he perceived was support by Canadians for a strong federal government, evidenced by the "Non" vote in Quebec and his return to power with a majority, Trudeau forged ahead with what he perceived were the country's problems.

Shortly after the federal election, Lougheed announced that

he would steadfastly not accept an agreement with the new Liberal Government that was not at least as attractive as the one which he had been close to closing with the former Clark government. More precisely, the two parties had agreed to allow staggered price increases of Canadian crude production to about 85% of world prices by 1984 [107].

In a related move, to assert greater control over what Lougheed feared would be an encroachment by Ottawa into Alberta's resource base, the Alberta government passed legislation entitling the Alberta Petroleum Marketing Commission to assume complete marketing control of crude production from provincial Crown-owned lands [108], which amounted to control over 85% of the total provincial production. Finally, failing to find an "acceptable" agreement as defined above, the Alberta Cabinet would withhold final approval of the Alsands and Cold Lake projects, both of which had received preliminary approval from the AERCB.

"Liberals to raise gasoline 16 cents." This headline appeared in the Globe in mid March, 1980, almost a month after the Liberals were back in power. This announcement belongs to the most flagrant examples of Trudeau hypocrisy. It most certainly must take a place alongside his imposition of wage and price controls in late 1975 against which he had vigorously campaigned in the 1974 election. The parallels, in fact, go beyond being striking. They are frightening. In the same announcement, Liberal plans for oil price increases were only "slightly less than that which the former Conservative government had negotiated." The Liberal Party could well be likened to a bloodsucker or some such

parasitic organism in that it preys on original policies, in the past most often conceived by the Conservative Party, although only after it has found itself in a safe enough position to do so. Perhaps that is called political and electoral ingenuity. Canadians lost faith in the Clark government, which, ironically, came closer in seven months to conceiving and passing a freedom of information bill than the Trudeau governments had in the past eleven years. It had openly stated its policies and plans, made a commendable attempt [109] at restoring honesty and forthrightness to the federal government, as well at restoring a dangerously widening rift in federal-provincial relations. For the net sum of 2 cents per gallon, Canadians sold their souls to the "Northern Magus" Pierre Trudeau, devil extraordinaire.

More significantly, the announcement of the raise in the price of gasoline also made known the government's intent to invoke a force majeure clause over the pricing policy of synthetic crude production. At this point, a quick backstep is necessary. Suncor was also granted world prices by the Conservative government for its production, with the proviso that Suncor commit itself to expanding production. The Syncrude right to world prices had been negotiated at the Winnipeg meeting. Both these agreements had a force majeure clause written into them, allowing the federal government to cancel the agreement in the event of an emergency. Federal energy minister Marc Lalonde legitimized his ministry's action through the unordered and totally uncontrollable events that had recently prevailed in the Middle East, and through the consequent dramatic increase in the world price for oil. The costs of Canadian production of synthetic crude were not justified by these prices. While the Canadian government at-

tempted to determine what a fair and just price was for synthetic crude production, however, both Suncor and Syncrude would continue to receive the world price.

When Lalonde met in mid June with his provincial counterpart from Alberta, Merv Leitch, for two days of talks aimed at settling the differences, the only outcome was a postponement of the existing agreement regulating the rate of domestic oil price increases. According to the Toronto Star, they "were unable to come even close to a new agreement on oil prices and related matters." The matters, or "oil slick" as the Star called it, would be left up to Trudeau and Lougheed to clean up when they met the following month.

A picture in the Financial Post showing the two leaders in deep contemplation said it all; the caption read simply: "Lougheed and Trudeau: The gap couldn't be closed." The only item of note was an offer made by Ottawa proposing a synthetic crude price of \$32/bbl, with an inflation escalator, for new tar sands plants. Over two months after the July meeting between the two leaders, at a second meeting between the two energy ministers, Lalonde raised his price offer for synthetic crude production from new plants from \$32 to \$38 per barrel.

These were the events that led up to the unveiling of the government's National Energy Program. In very many ways the events that followed the two cent election did not differ from what was to come. The above history will serve as a background against which the developments of the National Energy Program and all its implications may be compared.

9. National Energy Program

And then Trudeau beget the National Energy Program.

The National Energy Program, if one understands the Trudeau mentality, is quite typical of his propensity to invite and aggravate controversy, and at the same time demonstrates his characteristic conviction that his solution is the only and the optimal one. Brought down to the House together with the federal budget, the NEP constituted such a large part of the budget that Turner was provoked to comment that "Lalonde (rather than Finance Minister MacEachen) should have presented the budget."

If nothing else, however, the predominance of the National Energy Program in the new government's budget showed two things. The first was that the cogency of energy had now fully come to the attention of the government, and that the government had, in all probability, finally and correctly identified the issue of the newly opened decade. The second was that it truly did reveal the hypocrisy of the Trudeau campaign. In contrast to a pre-election article headlining that Trudeau's policy advisors had decided that "fuzzy policies win" [110] the emergence of the NEP in its clearly distinctive tone proved that Trudeau had known all along how he intended to deal with the energy issue; what he needed from the electorate, however, was broad support so that his policies, which he knew would have cost him reelection if he had presented them as Clark had during the election campaign, could be rammed through Parliament without fear of opposition. In short, the NEP was consistent in keeping with Trudeau's inconsistency. Unfortunately for Trudeau, his major stumbling block would forevermore be that element over which he had no control,

the preeminence of Alberta premier Peter Lougheed and his fortitude in opposing his federal rival.

The National Energy Program was designed to achieve three objectives. Listed in what can be assumed was their order of priority, these were: 1) to establish "the basis for Canadians to seize control of their own energy future through security of supply and ultimate independence from the world oil market; 2) to offer to Canadians the real opportunity to participate in the energy industry in general and in the petroleum industry in particular, and to share in the benefits of the industry expansion; and 3) to establish a petroleum pricing and revenue-sharing regime that recognizes the fairness to all Canadians no matter where they live. The international context, the NEP went on to argue, was not a legitimate basis from which to determine the true price of oil, as the functioning of a producing cartel and a downstream oligopoly of multinational oil companies served to distort what are the natural supply/demand workings in the marketplace price-setting mechanism. On conservation it went on to say that changes in demand would take time, "as behaviour patterns and industrial structures, premised on cheap energy, are modified." It went on to recognize the adverse impact of imports on the balance of trade. The detrimental effect of the rapid oil price increases of the 1970's on the economy was shown by a Department of Finance study which concluded that rates of return for Canada's manufacturing industries had been halved by 1978. In keeping with orderly development of Canada's natural resources, then, it was imperative that the economic impact of oil price increases be minimized while the development of energy progressed at a rate that would meet the economy's growing needs. The focus would have

to be centered on the price. In addition, because the costs of production in Canada did not warrant increases on the order of those in the international market, those increases that would be passed on could not be permitted to accrue to private industry. The fear of "windfall" profits had swept northwards from the United States, and the producers would be limited to their share (What was different, of course, from the U.S. case of windfall profits was that the oil price was not to be decontrolled in Canada.). Rather, a realignment of the revenues would be such that the government of Canada could fulfill its responsibilities of easing the burden of higher prices for consumers primarily by promoting conservation, while at the same time allowing the producing provinces a share which was both equitable and ample in the face of their financial needs and positions.

The words became numbers in the following ways. The present wellhead price of crude oil, at \$16.75, would rise at a rate of \$1 every six months until the end of 1983. Thereafter the rate would be \$2.25 every six months until the end of 1985. Commencing in 1986, the rate would again increase to \$3.50 until it would reach a reference price, which will be explained shortly. If by 1990 the wellhead and the reference price had not achieved parity, the government said, then "consideration should be given to a more rapid escalation." The reference price was to be defined as the lesser of \$38 per barrel (effective January 31, 1981, to be escalated annually by the Consumer Price Index), or the international price. This reference price was presently only applicable to synthetic crude production from the Syncrude plant, but was also intended for future "integrated oil sands and heavy oil projects, including Esso Resources Cold Lake venture, and for

enhanced oil recovery projects." They were designed, with "Canadian cost conditions" in mind "to provide attractive returns to new sources when they come on stream, and to provide new certainty to the industry." Perhaps the most stunning revelation contained in the NEP appeared on the next page, as the fate of the Suncor operation was outlined.

"The Suncor oil sands plant, constructed in the 1960's, has received the international price for its full production since April 1979, as a part of an arrangement with the Government of Canada under which the company undertook to expand its plant. The revenues accruing under this agreement have more than recovered the expected capital costs of the expansion, and unwarranted windfall gains would result if the arrangement were continued. Therefore, the production from the existing plant will henceforth receive the conventional oil price. The expanded production will be entitled to the oil sands reference price."

Also applicable to oil sands plants was an 8% net operating revenue tax. "Deductions such as those for exploration and development expenditures, capital cost allowances, and interest" would not be allowed. The depletion allowance for oil sands plants remained effectively unchanged. Integrated tar sands projects which were at least 50% Canadian owned and controlled qualified for an incentive payment of 10% for approved costs incurred in 1982 and thereafter. For those at least 75% Canadian owned and controlled, this was increased to 20% for costs incurred in 1981 and thereafter. It was the stated objective of the government that Canadians derive the benefits from the oil industry. The government hoped to achieve this by gaining at least 50% Canadian ownership of oil and gas production by 1990, which would be done by gaining Canadian control of a significant number of the larger oil and gas firms, which in turn would be spurred by "an early increase in the share of the oil and gas sector owned by the

Government of Canada." The government's initiatives would be self-financing; the projected revenue-sharing arrangement would increase the federal government's share from 12-24% of revenues, would decrease the provinces' share from 49-43%, and would decrease the industry's share from 39-33%.

As the analysis came pouring in, it became apparent that if this was the actual prioritization of the government's objectives, the means by which they proposed to achieve it as dictated by the Program's policies proved quite a different matter. How did the market react? The market perceived an increase in Canada's balance of trade deficit, and an increase in the government's deficit, both due to the spectre of increased oil imports. "On the first two days after the budget, the oil and gas index of the Toronto Stock Exchange dropped 780 points, or 16%. The value of the Canadian dollar dropped another cent, and as predicted, oil companies (even independent Canadian petroleum companies) cut their expenditure budgets significantly and directed their drilling rigs to the United States, where the "netback" to the producer, whether Canadian or American, was substantially better [111].

And it was said. The sun had set on Canada's future for oil self-sufficiency.

10. Constitution

As complicated as the picture may be appearing now, there is yet another element that must be introduced into our total picture of the tar sands fray. The issue of ownership of the oil sands as well as of conventional oil, and the issue over how the revenues should be divided among the triangle of industry, provincial government and federal government have entered the general constitutional framework that desperately requires reform in Canada. The origin of this problem goes back to 1867 to the British North America Act, Canada's quasi-constitutional document, which has guided the division of governmental power since Canada's conception.

There are two parts of the BNA Act that deal specifically with the issues of resource ownership and the raising of revenues through taxation. Section 91, subsections 2 & 3 authorize the legislative power of the federal government in the regulation of interprovincial, as well as international trade and commerce, and "The raising of Money by any Mode or System of Taxation." The exclusive powers of the provincial legislatures are outlined in Section 92, subsections 2 & 5. It grants "the direct taxation within the Province in order to the raising of a Revenue for Provincial Purposes" and "The Management and Sale of the Public Lands belonging to the Province and of the Timber and the Wood thereon."

The conflicts between Ottawa and the provinces are sharpest over the division of powers with respect to natural resources. It is not hard to see why. As a highly applicable commodity, oil has transcended virtually every physical and political border in

the world. In Canada, this is no exception. Oil produced on Crown land (constituting 85% of all cases), which includes conventional and synthetic crude, is the property of Alberta while it remains within the borders of the province, once it enters into interprovincial trade, however, oil comes under federal jurisdiction, subject to any tax the government deems appropriate. In addition, according to the Constitutional Guide, "as a last resort Ottawa has the (declaratory) power to take over or regulate oil-fields or uranium mines as well as the power simply to disavow provincial legislation." This is because the federal government is vested with the power to assert authoritative control in times of perceived emergencies. As oil is a commodity vital to the welfare of the whole economy, it would behoove the federal government to assert complete control over the supply and distribution of oil given dire circumstances.

Also to be noted is the fact that in the Constitution the Supreme Court of Canada has been designated the final arbiter of all cases of dispute between the provinces and Ottawa. Historically, the appointment of Supreme Court judges has been the sole responsibility of Ottawa.

How the dispute over oil pricing and revenue-sharing between Lougheed and Trudeau will be resolved is another matter altogether. As one of his other campaign promises, Trudeau advocated constitutional reform to a stronger degree than did Clark; having been stifled in his efforts at constitutional reform to date by the provinces, Trudeau has since threatened to attempt to unilaterally patriate the constitution, rework it and declare it as binding without the consent of the provinces. By so doing, of

course, he would obtain for himself the ability to supercede the authority of the provinces, virtually eliminating any last check on power the provinces might presently be able to exert over Ottawa. The Mutual Life Company of Canada, concerned over the outcome of the constitutional debate as much as other Canadians, including Trudeau, commented in an eloquently simple paper that "the decision by the Federal Government to proceed unilaterally has taken the debate into a new and potentially more dangerous phase by raising the question of the legitimacy of Canada's existing national structure [112]." The paper went on to say:

"As a people, Canadians have been little concerned with constitutional devices to check the exercise of power by any government commanding a majority in Parliament. The American tradition of a Bill of Rights, born of the deep suspicion many Americans hold toward unlimited government, is quite different. It has not travelled easily over the border into Canada as the present controversy clearly demonstrates. Canadians have relied on the political interplay between the federal government and the provincial governments, and on the trusteeship of the British government over our constitution, to provide the necessary checks and balances."

A year earlier the federal government, with the Conservatives in a minority position, had reluctantly agreed to a draft proposal which said that provincial rights would prevail except in cases of a "compelling national interest." In 1980, with the new Liberal government in a majority position, Ottawa rejected this compromise, and it is now unwilling to accept any restrictions on federal power [113].

While it has not been incorporated into the formal organization of government in Canada, the biannual meeting of the provincial premiers and the Prime Minister has served conspicuously to further the cause of federal-provincial relations. Smiley, in an

analysis of Canadian federalism [114] goes so far as to call it "one of the most crucial institutions of Canadian federalism." Smiley goes on to describe what he feels are the advantages the Conference has brought to these negotiations.

"In terms of potentiality, the Conference could prevail over even the constitution because the constitution could and would be amended in any direction on which the federal government and all the provincial governments could agree. In fact, the capacity to reach agreement is very much circumscribed by the divergent policy and partisan-political interests of its members." [115]."

With the determined inflexibility of the federal government's stance on unilateral patriation of the BNA Act, it therefore came as no surprise that, when in September 1980 the most recent convention of provincial premiers and the Prime Minister took place, the First Ministers Conference ended with the provinces in greater dissent with the federal government than ever before. The present situation, moreover, is an even more aggravated form of the situation before the First Ministers Meeting, as the presentation of the Liberal government's National Energy Program served to antagonize the expectations of the oil producing provinces, Alberta in particular.

11. Implications

The scene has been painted. Now all that remains to be done is to understand its meaning. The problems, ranging from that of the producers' to remove a superior oil from a mass of muck, to that of overcoming the vanity of a political leader who has been in power far too long, all merge into one. The issue was and continues to be that of price. The single struggle over what should be the price of oil in Canada, however, has reproduced itself into a multitude of hybrids; what should be the price of synthetic oil in Canada? Is the price of international oil a true market price or not? What is a price that will bring about conservation? Is such a price acceptable to Albertans? Is it acceptable to Ontario? If its isn't, what could happen? And so on.

To sort it out, and to understand what went where, how and with whom is still somewhat of a complicated mess. But political science and economics are by definition social sciences, and to have examined an issue such as that of the development of the tar sands from the one side without having looked at it from the other is not doing justice to an analysis of reality, or, as it sometimes appears, irreality.

Pricing.

In all my discussions with politicians, academics, oilmen and bankers, and from all the literature I have read, I have to date not found one fully integrated answer about what is a fair and reasonable price for conventional crude oil and what is a fair and reasonable price for unconventional crude oil in Canada. These questions must be answered with all, and the word "all"

must be emphasized, circumstances kept in mind. The National Energy Program has attempted to do this, but in my opinion it has grossly and almost certainly purposely neglected to keep all the circumstances in mind, and as a result, the price that is in effect today is not a "true" price.

The elements of price determination normally applicable to manufactured goods are not quite as simply derived for a nonreusable commodity such as oil. Not only the regular components such as the costs of production and transportation come to bear, but also the costs of exploration and the even more important aspect of replacement cost must be remembered. Over and above these costs, the investors' profit, itself a function of the risk of investment, must be added to derive a true price.

The argument that the international price is reflective of its value in the above sense has already been presented in Section 5.3. It is an accurate indication not only of what OPEC considers the user cost of oil to be, but also of what OPEC considers the replacement cost of the oil to be. To repeat: OPEC raises prices and raises and or lowers production at a rate which is consistent with their belief that the derived revenues from their production will ensure that their economies will be self-sustaining after their reserves have run empty. In that sense, then, the benchmark OPEC price is an accurate one that takes into account the global supply, demand, and future value of its use. Negating the short to medium term implications of contract prices, the same is even more true of the spot market price. The National Energy Program's assertion that international prices are contrived and inflexible to demand is an irresponsible and naive

allegation. The international price will continue to demonstrate a strong upward trend. The elasticity of demand for a nonrenewable will always be less for increasing supplies or decreasing demand than it will be for increasing prices and decreasing supplies. Nevertheless, international oil does have a price elasticity with respect to declining demand, something which the NEP simply cannot accept. (A more possible observation would be that the authors of the NEP did not want to accept it.) Curiously, "Business Week" ran an article in August 1980, shortly before the NEP was announced, wherein it described "the nagging problem of too much crude" on the international market. It said: "The plentiful supplies have sent spot prices tumbling to as much as \$4 per bbl. below contract prices in the last few weeks, but production has not fallen [116]."

Thus, to collect the evidence into a point, the international price is an indication of OPEC's perception of its present and future value, it is supply/demand elastic, and it does fluctuate. One of the first assumptions the National Energy Program makes, therefore, is wrong and this casts into doubt the competence of the authors in understanding the components of oil prices.

The replacement cost of conventional oil in Canada must be defined as that cost which is needed to bring new supplies on-stream, notably from the frontier areas as well from the tar sands. Perhaps one of one most lucid analogies on the replacement of Canada's conventional crude reserves with syncrude was offered by Mr. Fred Cummer, who is responsible for Texaco Canada's oil sands development program. He likened the situation in Canada to that of a warehouse clerk's problem. We were sitting on about

ten years worth of inventory, he said. To replace that inventory, if we wanted to, would cost us about 10 times more than what it cost us to buy the inventory we now have. So, we have two options that we can follow with the existing inventory. We can sell it cheaply, because it didn't cost us much to begin with. That would allow us to sell it off more quickly than if we sold it at a more expensive price. But it would definitely not give us the amount of money we would need if we wanted to buy more stock. If, on the other hand, we sold what stock we had at substantially higher prices, the stock wouldn't sell as quickly, but we would have enough money to replenish the inventory when it was sold off. The latter option, he said, was the obvious one to take in Canada, but it was the former, in his opinion, that had been taken by the NEP.

Is this true or not? All evidence would seem to indicate that Mr. Cummer, his bias as a member of the oil industry aside, is correct. It is not beyond reason to assume that if a commodity is underpriced, it will be consumed more. If overpriced, it will be consumed less. Since we already know that oil is price elastic, this rule of thumb is applicable here. In 1979, consumption of gasoline, the price of which is a function of the price of oil, increased by 4% in Canada, whereas in the United States, where the price for a smaller gallon of gas was more expensive in absolute terms and therefore even more expensive in terms of dollar exchange rates, consumption declined by 7%. Further evidence, provided by Gwyn, demonstrates what the low prices of oil did not only to Canadian consumption habits, but also to that of foreigners: "Beginning in the winter of 1980, American motorists began crossing the border to fill up with cheap Canadian gaso-

line, and foreign planes touched down at Canadian airports to fill up with low-priced aviation fuel." This practice, in fact, was confirmed to me by a native of Detroit in March of this year, indicating that little has changed since 1979. The Canadian record on consumption has been comprehensively outlined before; it was worth repeating for the sake of emphasis.

The National Energy Program fails to provide much evidence that its authors took Canadian-style conservation very seriously. By increasing the price of oil \$1/bbl biannually until 1983, the price of oil will rise less than the present inflation rate. The price of Canadian oil will be less than Can\$25 per barrel three years hence, while the price of international oil is U.S.\$35 per barrel at this very time. Not only will the real price of gasoline be decreasing, but, in all certainty, the differential between Canadian and international prices will remain, if not even increase. The "inventory" or conventional oil reserves will be depleted rapidly, with little extra incoming revenue with which to develop the alternatives, specifically the tar sands.

In so structuring their energy pricing scheme, it is ironic that the authors of the National Energy Program believe they know more about oil resource management than their counterparts in OPEC. While the reserves of certain OPEC members are substantially greater than those of others, the future value of their oil, which they will not be able to replace with an equivalent source such as the tar sands, with such other factors as international supply and demand at equilibrium, is priced at a factor greater than twice that of Canada's.

Clearly, this is what Lougheed perceived when the NEP was announced. Alberta calculated that its share of the revenues (about which more will be said later) would be 13-15% lower than those estimates put forward by the NEP. There was, according to Lougheed, no basis for negotiation until Ottawa showed a greater willingness to exhibit flexibility. The Lougheed government rebutted to the NEP by announcing cutbacks in the production of Albertan oil. As of March 1, 1981, in three stages at tri-monthly intervals, production would be cut by 60,000 bbl/d, amounting to a total reduction of 180,000 bbl/d by September 1, 1981 [117]. This move, which was preceded by the earlier legislation (after the February election, but before the NEP) that gave the Alberta Petroleum Marketing Commission control over oil produced on Crown land, was just the first exercise of those powers to shut in production [118]. To Lougheed, if Trudeau (embodied in the NEP) was planning to waste Albertan oil, the only smart thing to do was to keep it in the reservoirs, where it could only appreciate in value. Lougheed found the price increases inconsistent with those promised him by the former Clark government, and he pledged he would not accept anything less. Withholding of approval for Alsands and Cold Lake continued; the project cost estimates escalated subsequently. The implications of Lougheed's move could not have gone unnoticed by Trudeau. The announcement of the NEP, however, in many respects indicated the opposite.

The deal about to be closed off with the Conservatives before they were defeated in the House is an important one. It comes closest to a realistic rate of price increases for conventional oil. By 1983, it stated, conventional crude would be at 85% of the price FOB Chicago. Thereafter, it would remain at that

percentage of value. The price of oil, essentially, would remain 15% cheaper to Canadians than the decontrolled price of oil in the United States. This would allow Canadian manufacturers an energy input cost advantage for their goods, but would be high enough to encourage substantial conservation and more efficient use of the fuel. Moreover, it would result in higher revenues for both levels of government, as well as allow producers a greater cash flow to reinvest in the projects that would supply energy for the future. The negative impact would be on the consumers' pocketbook. This, it was argued, was necessary, and the longer it was deferred, the greater would be the impact when the jump to unavoidably higher prices eventually occurred.

What about the price for unconventional, or synthetic crude? A slightly different way of looking at this, is to observe what the government considers the opportunity cost of oil to be. Since oil is oil, and oil from Venezuela, Mexico or any other foreign country is just like the oil in Canada (i.e. it is a homogenous commodity), the worth the government places on buying crude from abroad should at least be equal to the value of synthetic crude output from a Canadian tar sands plant that would replace it. Let us take the example of Canadian oil purchases from Mexico, which can be deemed for all intents and purposes a secure source of oil. At present, the federal government buys crude oil from Mexico for a price of U.S.\$40 /bbl. (about Can.\$48.00) [119] through the state-owned company Petro-Canada. But in the National Energy Program, the reference price is set at Can\$38/bbl., to be escalated by the Consumer Price Index. Obviously there is something sickly here. The National Energy Program seems to endorse the practise of paying more to foreigners than to its own

domestic producers. The difference, however, between the price paid to Pemex and that paid to Syncrude, is greater than just the nominal difference times the exchange rate per barrel because the multiplier effects have been left out. But wait, there is more. The oil imported from Mexico is a heavy oil, unlike the synthetic crude from Syncrude or Suncor, so heavy, in fact, that Canadian refineries cannot handle it. This oil must be refined in the Caribbean or the United States, the refining charge for which adds to the amount of outgoing or exported payments. One last thing: heavy oil has a substantially lower yield of high value distillates than synthetic crude does. Taken together, the amount the Liberal government would be willing to pay for synthetic crude output from a tar sands plant in Mexico would probably be in excess of Can\$50 per barrel. Stated differently, the opportunity cost that would be foregone by Canadian synthetic crude producers is the difference between what their product would fetch on the world market, or about Can\$50 per barrel, and the price they receive domestically, or \$38 per barrel. About a 30% difference.

The new reference price also discounts a very important aspect, namely security of supply. Mexico, the United Kingdom, and China, as non OPEC producers, are free to choose a price which the market will bear. One of the reasons why the oil from these countries can be sold at a premium is that they are politically stable, and consuming countries perceive them as being secure sources of oil supply. The Canadian government has never really taken into consideration the value of the security of long-term oil supply the tar sands would offer, but rather has always taken this for granted.

Cummer had something else to say about the cost escalation clause. The Consumer Price Index, he noted, was invariably below the Industrial Price Index. The cost to the producers under the NEP would increase at a faster rate than their revenues, that is, as long as the Industrial Index was greater than the CPI. The government had simply taken the wrong index, as far as holding the producers' margins at par was concerned. Any hope of producers to enjoy increased returns was marginal at best. Herein lies a major pricing disincentive for tar sands developers; the NEP offers no opportunity for upside profits, only downside profits, which would occur in the event of technical breakdowns.

When asked to comment on the price Syncrude was receiving in the NEP under its cost escalator clause, and the possibility that the CPI clause would be grounds for future renegotiation between tar sands producers and government, all with respect to the former agreement which he had helped to negotiate in Winnipeg, Turner simply smiled and shook his head. "The government of the day welched on the deal. There's just no two ways about it." It was evident that Turner felt the government, of which he used to be a ranking member, had taken the wrong path, and that the world price was what Syncrude should have been receiving.

Another way of looking at the process of establishing a price for tar sands development was suggested by the president of Shell Canada. He proposed a compromise pricing structure for oil sands production that would link the price to world levels, but would also provide safeguards against excess profits in the event of a rapid escalation in world prices [120]. This is very much like treating the tar sands projects as if they were utilities.

In fact, many oilmen in Alberta with whom I talked felt that this was a good solution, since it would ensure the government that the public wasn't being gouged, and the producers would be guaranteed a rate of return. This return, however, would have to be commensurate with both the technological and financial risk; the present policies of the NEP do not reflect the risk aspect of developing the tar sands with billions of dollars of retained earnings.

For Syncrude, either the reference price of \$38 per barrel or the international price offers a good return. With operating costs at \$22 per barrel, Williams said, the consortium was still making a handsome profit after taxes and royalties. He was quick to point out that it would still be several years before Syncrude will have paid itself off and started providing a return on that investment. The rate at which this was occurring, he said, was admittedly faster than originally anticipated, but with the uncertainty of faster-than-expected cost increases, plans for expanded production, and the NEP's CPI clause and new price, the likelihood that repayment on the investment would continue at the present rate was conjectural. He then mentioned the NEP policy that dealt with Suncor, over which he voiced great concern. Calling it "the dirtiest trick that has ever been pulled on a company in North America," Williams predicted that Suncor's prices were intentionally rolled back to make Suncor's operation marginally profitable, which in turn would make Suncor a likely acquisition target for Petro-Canada's mandate to buy out foreign-owned oil companies. The same thing did not occur to Syncrude, he said, because with Petro-Canada as a consortium member such a rollback would be detrimental to the company's interests. The

Suncor policy in the NEP was significant not only because of this, Williams went on, but also because it set a dangerous precedent; the federal government had quite illegitimately taken back something promised to Suncor by the previous government. When asked about the way the NEP singled out Suncor, MacDonald pointed out that Suncor had not struck a special deal with the government when it began operation in 1968, and that as the pioneering entrepreneur, it had assumed certain risks. This argument did not say whether the government was entitled to confiscate, or retract a former government's agreement. Most likely, MacDonald's reply was intended as a non-answer, since to take a position on the Suncor issue might endanger his aspirations towards becoming Trudeau's successor as leader of the Liberal Party. John Turner, on the other hand, had an unequivocal two word answer to the same question: "It's stealing." The Suncor clause in the NEP will not be something easily forgotten by consortium members as they finalize their agreements to build their projects.

By focusing on the "now" price, Trudeau has placed an inordinate amount of emphasis on the present cost of producing conventional oil, and not on the future cost. Lougheed has been quoted as saying that the price of oil should be determined by its value as a commodity, and not its cost of production [121]. The two cent election has delayed and magnified the hazards of domestic energy supply greatly. Carleton University in Ontario (Ottawa) conducted a nationwide poll [122] wherein respondents were asked whether they felt oil prices should rise faster, to which 51% replied affirmatively, or slower, to which the other 49% replied. This poll was taken in December of 1980, well after

the NEP had come out. It is perhaps this author's degrading attitude that the 49% replying negatively to faster rising oil prices have little understanding or appreciation for the need of economic rationale. Nevertheless, that at least half the population of Canada perceived a greater need for higher oil prices is tremendously important, because it paradoxically confounds the strong contention held by Trudeau that he enjoyed the support of the people in Parliament for his position on energy policy.

In fact, it has been the province of Ontario that has dictated energy pricing policy in Canada since the defeat of the Clark budget. Let us recall that Trudeau used an energy platform during the ensuing election campaign that sounded "suspiciously familiar" to the one proposed by Premier William Davis. Let us recall, as well, that the Liberals won 30 seats (the margin needed for a majority) more in the '80 election, and that the vast number of these came from the province of Ontario. The so-called "made in Canada" price ballyhooed by the Liberals is really "made in Ontario." The realization of this (not unknown to Lougheed) and the thought that a fellow Tory premier is exerting control over his province's resources infuriates Lougheed.

Lougheed is justified in holding out. The price he wants is the price that will be needed to develop the tar sands. The Royal Bank of Canada estimates that \$1.4 trillion dollars will be needed for investment for energy purposes in Canada by the end of the century. Of this, oil sands investment will be \$100 billion. Approximately one third of the total will have to come from offshore sources; Lougheed is aware of what is needed to persuade the foreigner to invest in Canada energy future: a sound and fis-

cally responsible petroleum policy. [123]. A way of putting this into perspective is to point out that during the pre-OPEC decade from 1964-1974, the total for all forms of energy investment in Canada averaged a little more than \$2.5 billion annually. [124]. With capital cost requirements for tar sands development this high, and with the oil industry already reinvesting more than 100% of its cash flow, the government's contention that the oil industry would be reaping windfall gains as a result of higher prices is totally fallacious. In 1978 the industry invested \$10.9 billion and in 1979 \$10.0 billion. This, according to the Northern Miner, is more than double the value of all the oil and gas production from Alberta in 1979. Ironically, in 1978, the Ministry of Energy, Mines, and Resources acknowledged that "the investment performance of the industry gives further assurance to the Canadian taxpayers that the revenue for increased oil and gas prices is being reinvested in exploration and development for new energy resources in Canada." Furthermore, for the period from 1973-1976, profits for the largest oil companies increased by 12.2%, but their capital expenditures increased 83%. The overall return on net worth was 15.1% equalling that for manufacturing industries [125]. Bill Richards, the president of Canada's darling oil company Dome Petroleum, also passed comment on the government, saying: "Canadian oil and gas companies now are reinvesting all of their profits, and criticism of oil industry profits is unjustified." The oil industry has demonstrated its willingness to reinvest its earnings into increased exploration and development. The Oil and Gas Journal, four years ago, commented that the long term replacement costs of the the energy Canada consumes (41% of which is oil) are above the price the na-

tion pays and the revenue producers are allowed [126]. Thus, there can be no question that if further tar sands plants are to be constructed, the issue of the price for synthetic crude will have to be secondary.

For all those left-wing federalists, as Foster calls them, one cannot but help remember that the federal government and provincial governments together exert as much control as they want over the oil companies. Besides being politically unattractive, granting the world oil price to tar sands producers would not be regressive by any means. The federal government has the tax incentive tools and means by which it can redirect what it considers to be excess profits back into further tar sands development and frontier exploration. This is but another way of expressing a form of utility financing, where the producers are guaranteed a certain return, over and above which they will be required to reinvest.

Although a former member of the Liberal Party, John Turner has also been described as a man who espouses some conservative ideas, specifically those of allowing the market to follow its own course. This was revealed in some of his remarks to me. Asked how he would have formulated the 1980 Budget with respect to the National Energy Plan, Turner replied that he would have added a more generous helping of tax incentives for producers, and would have allowed the price to increase at a faster rate than was in the NEP. He proposed taxing profits at a 100% rate over and above a level (i.e. implying a sliding scale tax schedule), to be exempted if the equivalent amount was reinvested in energy projects. This, he said, was in the name of ensuring future supplies

of oil. "I mean, we need them," he said.

Unfortunately, a definitive oil price was not to be elicited from Mr. MacDonald. Nevertheless, he did give an indication that the oil prices as they were today did not match what he had expected them to be. Specifically my question addressed itself to two government statements. The first was a speech made by Trudeau on December 6, 1973, wherein he declared that Canadians would have to pay more for their oil, "enough to ensure development of the Alberta oil sands, and other Canadian resources, but not one bit higher." This particular statement was made at the height of the Syncrude controversy. The second government position to which I addressed my question was a letter written by MacDonald to the Syncrude participants wherein he stated that it was the government's explicit policy to leave the development of the oil sands to private industry, and that it was to be done in the most expeditious way possible, specifically by allowing Canadian prices to rise to the international level over the long term. In light of these policy statements, and the time that had elapsed since, had the rate of price increases and oil sands development proceeded at the rate he had foreseen? MacDonald's answer was no.

It is therefore possible to make the following concluding remarks on the issue of pricing. First, the price increases proposed by the NEP are less than sufficient to stimulate further tar sands development. While the prices offered by the NEP are attractive to the Syncrude project, it must be remembered that Syncrude's costs (\$2.2 billion) were a fraction of what a similar plant, such as Alsands, costs today (\$8 billion). The rate at

which costs will continue to rise, moreover, will probably not be covered by the rate of increase as measured by the Consumer Price Index. Second, the authors of the NEP understood very little, if anything, about the value of the existing conventional crude reserves, about their relationship to meeting the present and future demand for oil, about their relationship to supplies and reserves of international oil, or about the profitability and reinvestment trends of the petroleum industry. Consequently, they abused the normal methodology of oil pricing used worldwide, and misapplied it to domestic oil pricing. The implications of this are threefold. The price of oil as proposed by the federal government is not in accordance with the expectations of past and present members of government, demonstrating that the government has been inconsistent in its pricing policy. In particular, the NEP does not come close to Premier Lougheed's stand; therefore, the Alsands and Cold Lake projects will continue to be delayed. The second implication is that conservation will effectually be nullified as the price of oil increases at less than the present inflation rate over the next three years. The third implication is the reduction and sterilization of a substantial amount of available recoverable reserves, of both conventional and unconventional crude. The reserves of tar sands being a function of oil, as defined by the Economic Stripping Ratio, the reserves and hence lifespan of at least the Suncor project have been curtailed. This in turn results in a phenomenon known as "high-grading", or a faster-than-normal depletion of less production-costly, but from a refiner's point of view more valuable, medium to high quality crude reserves. The R/P ratio will be eroded, and the oncoming of a crude shortage more precipitous.

The pricing of oil, as we have seen, has multiple ramifications. It is very important that all these variables be included. The NEP has obviously failed to do this. The origins of this shortcoming, as already stated, are political. It is, however, entirely possible that these variables could have been considered to a greater degree than they were, given the same political constraints.

Revenue Sharing.

In great part, the NEP was preoccupied not so much with the problem of how to make a bigger pie, as we have seen, but rather, with the problem of how to cut the existing one. Revenue sharing is just as much an issue of heated contention as that of pricing.

Revenue sharing is an issue in the discussion over which the oilmen have increasingly been left out. Their voice has, over the years, been attended to with a deaf ear, as can readily be seen from their decreasing share; from a high of 69.3% of petroleum producing income in 1970, the 1979 share stands at 39.3% [127]. The most precipitous drop occurred between 1973-1974, when their share declined by 15%.

Conversely, the share of the federal and provincial governments has been increasing. The NEP, however, now wants to fill federal coffers at a rate much greater than ever before. It justifies its intent to double its share from 12% of petroleum derived revenues to 24% by citing a "national claim by all Canadians to a share in these (oil and gas) revenues and benefits." "The Government of Canada must have a reasonable share of revenues from oil and gas production, if it is to shield Cana-

dians from the full impact of the negative economic shock, and help bring about the adjustments that must be made in Canada's economic, energy, and industrial structure." It goes on to list as examples other countries such as Norway, England and Australia, where the federal government receives a larger share than Ottawa presently does. It is aware, of course, that Australia, being a federal state like Canada, and not unitary like the other two mentioned, is the only comparable one. But, as many of us are aware, Australia is not an oil producer of Canada's magnitude, and to the extent that the Australian government chooses to intervene in its petroleum industry, its impact will be significantly less noticed than the impact the federal government exerts over the oil industry in Canada. Therefore, the comparison is invalid.

Then the NEP gets around to the real issue at hand. "What share of revenues reflects the needs and responsibilities of the two levels of government?" it asks. It then goes on in successive paragraphs to paint a lopsided picture that would justify its claim. Alberta, it said, was receiving over 80% of the revenues gained by provinces, despite the fact that it had only 10% of Canada's population. Moreover,

"Under existing arrangements, the Government of Alberta is enjoying rapid increases in its oil and gas revenues. Its revenues have grown faster than its expenditures, even though those expenditures have grown faster than any other province. Alberta has been able, moreover, to reduce substantially its tax rates for non-resource corporations, and its citizens enjoy the lowest tax burden, and the highest disposable incomes, in Canada." [128]."

Therefore, it concluded, Alberta really didn't need any more money, because it would run up budgetary surpluses.

I will allow myself a comment or two. First of all, it is to be expected that Alberta will receive more than 80% of the share accruing to the provinces. If it had 99% of the people in Canada, or only 1%, this would make no difference. Since Alberta produces 85% of the oil in Canada, its share of the total going to the provinces will be of the same proportion. The second is that the tone of the paragraph seems to suggest that, in this day and age, a budgetary surplus is an economic evil. Thirdly, the question of why the province of Alberta has decided to run surpluses is not addressed, and as we will shortly see, there is a very good and legitimate reason why Alberta should do so. Lastly, having described the good health of the Albertan Treasury, the National Energy Program inexplicably forgot to measure the wellbeing of the Federal Treasury, the dire state of which, for all intents and purposes, and rhetoric aside, the NEP was intended to redress.

The province of Alberta has established the Alberta Heritage Savings Trust Fund, into which one third of all provincial oil and gas royalties flow. The purpose of this fund is to act as an insurance policy for the province to ensure that its economy and people will continue to flourish when the oil and gas have been depleted. Because of the traditional subordination of the West by East, and the lack of attention the West has received from the federal government, the provincial government has found it necessary to make these provisions. The Heritage Fund is truly huge. At last report, it stood at \$6.5 billion. And the rate at which it is growing is even more stupefying, perhaps, than the size of the oil sands themselves. To quote a few appropriate lines from Foster:

"As Max Gunther said in The Very, Very Rich And How They Got That Way : "One hundred million dollars are more dollars than the mind can comfortably conceive. Laid end to end they would stretch from here to -- well, a hell of a long way.

In terms of Alberta's wealth, even a hundred million dollars seems like nothing. Alberta's revenues are accumulating at the rate of more than \$3 billion per year. That works out at around \$8.64 million per day, or \$6,000 per minute, or \$100 per second [129]."

Foster then takes the liberty of expressing the buying power of this amount in 11 different ways, each more intriguing than the last. But the last is truly the most intriguing, for it scours up possibilities that would put the NEP's concept of "Canadianization" totally to shame. This is that, at the rate calculated by Foster at which money flows into the Heritage Fund, it would take five years and 211 days for the province to buy the 35 largest publically-owned oil companies in Canada, based on December 31, 1978 share prices. The fact that it was Trudeau who suggested in 1974 that Lougheed remove a fraction of his oil revenues into a capital account that eventually was to bear the name "Heritage Fund" is even more revealing and ironic. It demonstrates that Trudeau is incapable of understanding how the helpful advice he gives to others may equally be used to undermine him.

Paranoia is perhaps the word to describe the NEP's approach to revenue sharing. It is plausible to assume that an American magazine writer, looking upon the federal-provincial squabbling, could provide unbiased analysis to his American audience. He has no motive to do otherwise. In an article headlined "Why Alberta's financial power scares Ottawa," "Business Week" examined what kind of money management the Alberta Treasury was exercising with the Heritage Fund. It concluded that "Alberta is emerging as a "petro power" within Canada" because it was "investing a smaller

relative percentage of its cash flow within its own borders and huge absolute amounts in other provinces." In effect, Alberta had the financial influence to offer "subsidies to all the other provinces of Canada."

"This is where the Heritage Fund and the growing wealth of Alberta come into conflict with Ottawa. Alberta is emerging as an autonomous center of financial power in Canada and establishing links with other provinces that totally circumvent Ottawa's federal authority. The federal government is pressing for greater distribution of Alberta's energy wealth - and it has the backing of provinces such as Ontario, which consume a lot of oil while producing very little. They (presumably Ottawa and Ontario) want prices for Canadian oil and gas kept far below world markets, and are pushing for heavier taxation of Alberta's revenues." [130]."

Alberta's growing power would not be so very threatening to Ottawa, if Ottawa didn't have its own finances in order. The real reason why the NEP is pursuing a higher share of revenues from the provinces is because it badly needs to finance the deficit that Alberta doesn't have (See MacEachen's statement in section 4.3.2.2. above.) The federal deficit is in fact so large, it is virtually out of control. For the current fiscal year the deficit will surpass the \$14 billion mark. The difference, then, between Ottawa's rags, and Alberta's riches, is \$20 billion.

Reducing the deficit by other means than increasing oil revenues is simply not possible for Ottawa, because the government has "handcuffed" itself with fiscal commitments, growing at a rate of 13% in FY81. We have talked about the burden that imports impose on the federal budget, but this is only a share. More than 17% of the budget is allocated for simply servicing the national debt, which on a per capita basis has increased three-fold over the last decade. 41% of the budget must be directed to

expenditures for social affairs, and these "are uncontrollable because they are either statutory or indexed or both." A further 6% goes to fiscal transfers, which cannot be cut back. The 13% spent on justice, external affairs and defence matters offer "little scope for saving." Not including the amount Ottawa pays for import subsidies, these uncontrollable items amount to approximately 77% of the government's expenditures. The remaining 23% are allocated towards economic and energy development, and represent the most flexible aspects of the budget, in terms of government funding. [131]. With government subsidies of imports built into the picture, however, the amount of control the government is able to exert over its expenditures is extremely limited indeed. Being unable to increase the size of the pie, the NEP as a revenue producer had little choice but to go for a larger slice of the existing pie. To the question of whether the intended NEP-increased federal percentage of oil and gas revenues was meant to offset Canada's escalating import oil bill, and its contribution to the deficit, Turner replied with an unhesitating yes. Another political scientist devoted an entire section of his analysis of the Canadian federal system to the Trudeau Administration's ability to manage its accounts, and titled it, "Financial Administration as a Regression Equation Run Wild [132]."

The following is the NEP's budgeting forecast of its policies:

"The Government of Canada will obtain an estimated \$24 billion over the four years 1980-1983 from oil and gas revenues...More than \$21.9 billion, or 90% of the revenues, will be spent on initiatives arising out of the National Energy Program. The remaining \$2.1 billion (9%) will be used to support the government's general economic program."

\$2.1 billion earmarked for the government's general economic program would do well to alleviate one seventh, or 14%, of the government's deficit. The federal government did not address the issue of revenue sharing very diplomatically. By grabbing, and not taking what the historical trend in the sharing of revenue showed it would eventually get anyway, the government revealed its true needs to locate and confiscate funds to offset the growth of its deficit.

The system which preceded the NEP was described in a 1979 EMR paper on Taxation and Revenue Sharing as one that had "developed, both at the provincial and federal levels, very much in an ad hoc responsive manner." EMR's evaluation of the system then was such that it could "be counter to the stability the industry quite justifiably encourages." It is safe to say that if the evaluation of the taxation system before the NEP was thought to be possibly regressive, in light of the above, then, the NEP can certainly also be considered regressive. As Dick Aberg, vice president for the Alsands group, said: "if you don't create the wealth, you can't redistribute it." The NEP had put the cart in front of the horse.

Constitution.

The three fundamental constitutional questions that need to be addressed are deciding what the appropriate balance between national and regional communities should be, what the appropriate

relationship between citizens and government should be, and how these should be translated into a concrete division of powers between the two levels of government. Unless the draught of the new constitution bears a strong resemblance with respect to Sections 91 and 92 of the BNA Act, there is little hope that it will be accepted by the provinces and by the people of Canada.

In his reelection campaign, Trudeau pressed for patriation of the BNA act. The latest attempt to find concensus among the provinces failed miserably. Why? Each of the First Ministers

"had to protect the dominant economic groups in his territory, preserve or enhance the policy-making capability of his civil service, stand up for what he felt were the feelings of the voters who put him in office, and safeguard the integrity and well-being of his political unit as a whole.

Thus Mr. Davis supported the federal government on powers over the economy, perceiving the possibility of provincial barriers as a threat to Ontario's position as the centre of industry; Premiers Lougheed, Bennett and Blakeney were adamant in their demands that Ottawa not interfere with natural resources.

They knew what they wanted. But apparently what each was offered did not quite match the price each was asked to pay. And there was too much at stake to permit the sort of give and take needed to produce agreement on a complex set of issues [133]."

As the stalemate continues, Trudeau will argue that Canadians are fed up with provincial obstruction and tired of working. He stands prepared to exercise the power made available to him, and ready to force closure in Parliament to hurry the resolution along.

"Believing he has most of the legal weapons on his side, and with a solid majority in Parliament, Mr. Trudeau is confident. He does not believe that Britain can refuse his request, or that it can be blocked in the Canadian courts. He is equally confident that in a battle for public opinion, the people will support him, not the provinces. Parliament, he says, speaks for all Canadians. But against this is the view that in a federal country, parliament speaks for the people only in matters of federal responsibility: on other matters the provincial legislatures speak for them. In addition, the lack of Liberal seats in Western Canada significantly undermines the federal claim to speak for the whole country, though that would be a less severe problem if the government were to get all party support in the Commons [134]."

On the subject of ultimate power, which Trudeau has threatened to use should the provinces continue to be inflexible, and of the Supreme Court's appointments made by Ottawa, some feel that the court has favored Ottawa in recent important decisions, that it is "perceived by some provinces as a creature of the federal government and hence responsive mainly to Ottawa's views rather than provincial concerns [135]," and that Trudeau can expect rulings on the patriation of the constitution to go his way. A greater provincial role, a greater check on the final power of Ottawa, should be taken by the provinces in appointing judges [136]. Although the premiers have vowed to challenge Trudeau's right to patriate the constitution unilaterally in the courts, there is an element of doubt that when the final judgement is handed down, their efforts will have been in vain because of the Supreme Courts partiality towards the federal government.

Indeed, because Ontario is the most populous province in the country, and represents the swing province in the nation for seats in the House, it is possible to argue that at present, the province of Ontario is essentially the voice "for all Canadians." Trudeau has interpreted his majority, in a sense, to mean that,

whatever he does, it will be in the best interests of Canada as a whole, and that the regional disadvantages will be less than the advantages for the country as a whole. Mr. Davis' provincial Tory support for the federal Liberals in the matter of constitutional reform is unabashedly self-centered and unusual, according to Robin and his analysis of Ontario-Ottawa provincial to federal party relations [137] and only buttresses the adage that politicians will sell their souls and political beliefs to stay in power. The country is represented de facto in the Commons by Ontario, and what is good for just Ontario, at the expense of the other provinces, is the equivalent of stripping their legitimacy and authority from them.

Separatism.

"Let the eastern bastards freeze!" -- Albertan bumper sticker

It is ironic to think that to a certain extent Trudeau won reelection on his platform for national unity and the need to patriate the constitution, all the while refusing to commit to an articulated and exact energy program, because it is over the issue of energy pricing, revenue sharing, and most of all, ownership of natural resources that the real threat to national unity resides. Even the president of a Montreal consulting firm, Charles Perrault, felt that "the possibility of a major confrontation between the energy-producing provinces and the federal government is much more menacing to Canadian unity than was this (Quebec) referendum [138]."

This possibility, which Ontario Treasurer Frank Miller has described as "a piece of dynamite" which "could just go bang," has already been ignited. The question is, how long is the fuse? There are those in Western Canada who feel that Lougheed, as unofficial spokesman for the resource-rich Western provinces, has done a great deal in speaking up for their cause, but that in terms of results, his means to the end have not been radical enough. According to the Carleton University Poll, for 14% of Westerners separatism provides the only answer (75% were against separatism and 11% did not reply [139]). While I myself was in Alberta "An old-fashioned Western meeting -- on separating" [140] took place. The atmosphere at these rallies is heated:

"He denounces Eastern centralized socialism, the Eastern economic establishment, Ontario, bilingualism and the federal Government. For him it is all part of the same conspiracy to despoil Alberta of its oil and agricultural wealth.

"Gone will be the entrepreneurial zeal, gone will be the capital, gone too will be human freedom," he shouts. The audience cheers.

"Is this the Canada that we want?" he continues.

"No, no, no," returns a chorus of half a hundred voices and more.

"God bless the entrepreneurs," he shouts. "They are the backbone of the country."

The audience responds with tumultuous applause.

"My children will be masters in their own home," he (the next speaker) predicts with obvious sincerity, amid thunderous applause.

(The phrase "masters in their own home" was the slogan of Quebec's former premier, Jean Lesage, that brought him to power and signalled the start of the Quiet Revolution.)

These meetings take place about once a week. The meeting cited above was organized by West-Fed, the largest separatist group in

Canada west of Quebec, with more than 30,000 paying members. The effectiveness of these organizations has not gone unnoticed by even Trudeau, who recently lashed out at it declaring it "hysterical [141]." On the other hand, Lougheed has lent a touch of legitimacy to the separatist movement by declaring a sympathy for the PQ victory in Quebec in 1976. "Quebecers have a desire to be masters in their own houses. I have an empathy with that feeling [142]."

Trudeau's comment demonstrates an inability to understand the pioneering personality of the Western Canadian [143]. Separatism for Trudeau is different in the West from what it is in the East. He failed to see that the fundamental "difference between the west of the prairies and everywhere else is that the prairies created themselves [144]." Born and raised in Quebec, Trudeau understood very well the cultural needs and aspirations of his fellow people, and was able to help them in their search for a cultural identity within the confines of his vision for federalism with his programs for bilingualism and constitutional reform. But of the Canadian of Anglo-descent he knew, and wanted to know, little. For a long period of time, Trudeau avoided the West, did not travel or visit there except when members of the monarchy visited Canada and an election was looming, and his disenchantment with the West manifested itself in the bills that were passed in Commons [145]. The life of the Albertan was very well described by Lou Hyndman, the province's treasurer, when he addressed the affluent members of the Canadian Club of Toronto:

"The Albertan is a risk taker, an optimist, a realist, a person who likes diversity, who plays by the rules of the game, a person who likes tenacious (sic) and a little prudent when it comes to savings...Certainly my forebears, my grandfather when he came to Edmonton via Portage la Prairie, said good-bye to friends and relatives. He gave up what was known and what was comfortable and what was predictable to move to an unknown part of the country where there many differences, few comforts, where there were strangers, where it was a gamble every day and every week with the weather, where there was uncertainty about world markets (for wheat) and costly transportation systems."

The homegrown attitude of the West towards honesty and forthrightness and the way it pervaded every element of the Albertan social, economic and political way of life, contrasted sharply with the sophisticated double-dealing which had become the Eastern way of life, which Trudeau had learned thoroughly and had come to love.

Joe Clark took the liberty of describing Trudeau as a "European Canadian rather than a North American Canadian." Considering this thought together with two other things, namely, more than a dozen years with Trudeau in Ottawa's captain's chair, and Trudeau's continued obsession with granting priority to the problems of the East, there can be little wonder that the polarization between the two geographic extremes has been approaching its maximum tolerance point.

Dr. MacFadyen, a professor of political science at the University of Calgary, described the separatist movement as a genuine threat not to be underestimated. "It's a much stronger grass roots movement than people down East give it credit for." He felt too that it was greater in importance than Quebec had been. Unlike the situation in Quebec, he continued, where the cultural separatist movement started in the universities, the

movement in the West started in the small isolated towns and villages. It was not so much a product of well publicized propaganda as it was a product of a belief that had been individually and collectively created and fostered over a long period of time. The people, he said, had come to be frustrated by what they perceived was a bureaucratic strength on the part of Ottawa greater than their own electoral strength. For some, taking matters into their own hands was the least desirable, but at this point the most effective alternative to redressing this problem. Though MacFadyen himself is not a separatist (A colleague of his, however, Warren Blackman, an economics professor with his office located three doors down the hall from MacFadyen's, was one of the "speakers" at the West-Fed meeting cited above), he understands and sympathizes with the separatist movement in the West. The subordination of the West to the East needed to be rectified; the retribution was justified on these grounds. What incensed Westerners so was the Easterners' feeling that only they had the right to be power-mongers, both economic and political, and that to suggest that this right should be made available to Westerners was next to heretical.

In a free and democratic society, the rights of minorities and effectively unrepresented people must still be observed. There can be no doubt that, according to the British North America Act, the people of Alberta have a legitimate right to their natural resources, which include the tar sands. They are cognizant of the fact that lately they have profited greatly from the wealth of their oil and gas reserves, but they are even more aware of two basic examples that have paraded before their very eyes. The first is the economic desolation of a country or state

like Oklahoma, (Tulsa is one of Lougheed's favorite examples) which did not take necessary precautions, and found itself deserted and isolated after the oil ran out. To coin a phrase, "Après l'huile, la deluge" is what Albertans envisioned. The second example, which must be perceived in conjunction with the first, is the hardship and toil which the western provinces underwent before their rise to financial preeminence and economic growth, and how in those times the federal government left them to fend for themselves. With the lack of historical examples, was there really any reason to believe that Ottawa's rhetoric, given a leader primarily interested in francophone and central Canadian issues, would change? The answer, as Turner would have made it, is a straightforward and unequivocal "No."

Political Actors and Mandates.

I'm the Sheik of Cal-gary
 These sands belong to me
 Trudeau says they're for all
 Into my tent he'll crawl
 Like Algeria did it to DeGaulle.
 The gas we've got today
 We just don't fart away
 Gas pains don't worry me
 Cuz I'm the Sheik of Cal-gary...
 [146]

As much as the federal-provincial conflict is one over issues, the political figures that lead their arguments into battle also play an integral role in the overall scene. Personalities, if strong-willed enough, tend to chafe against each other in the heat of any fray, and in the case of Lougheed vs. Trudeau, or Trudeau vs. Lougheed, whichever the case may be, this is espe-

cially true.

The ditty above does a pretty good job of summing up Lougheed's character. Without the fortitude and daring of this man, it is safe to say that the Albertan cause would not have advanced as far as it has to occupy such a prominent spot in daily Canadian life. But Lougheed owes a great deal to the member countries of OPEC. From them and the stark reevaluation they placed on their oil, the people of Alberta took the inspiration to fight for and "maintain a large share of the "spoils" of higher oil prices...(which) gave it both a new identity and the funds to become the wealthiest province in Confederation [147]." In general, for the resource-rich provinces, "their wealth is the key to their own development: it is as important to them as (constitutional) rights are to Ottawa. For them resources are the means to redress the historic subordination of Western Canada. [148]." But the power of oil as a medium needed still a spokesman and that role was provided by Lougheed. In The Tar Sands Pratt says of Lougheed:

"What Peter Lougheed articulates so well are the politics of resentment, the frustrated aspirations of a second tier elite for so long dismissed as boorish cowboys, as yahoos with dung on their boots, by the smug, ruling Anglo-French establishment of Ontario and Quebec."

The West had found a golden football, and a platinum quarterback to boot. The team was worth billions, and it was ready to move downfield. The constitutional right that natural resources belong to the provinces was first used by Lougheed, and as Foster describes it, Lougheed was prepared to use it like a "bludgeon." Foster too feels the premier deserves a healthy helping of praise: "Peter Lougheed has an unmistakable aura of the Divine

Right."

Lougheed undoubtedly does not have the Divine Right. What he does have, however, is a mandate that is unparalleled by any other premier in Canada, and that is almost as good. He joined the virtually defunct Conservative Party in 1962, and his rise to prominence is a short story. In March of 1965, Lougheed won the Party's leadership, and embarked on a revitalization program that included sophisticated electoral analysis and mastering the use of television "as a weapon of opposition politics [149]." In 1967, the provincial Tories won 6 seats and 27% of the vote, a significant improvement over their performance over the past decades. Four years later, the Conservative Party had assumed power with 49 seats in a 75 seat legislature, barely six years after Lougheed had entered the political melee. His popularity had increased to 46.5%. By 1975, it was 69 seats, and a popular vote of 63%. Pratt and Richards estimate that the Tories will remain in power for at least another decade [150].

Lougheed's ascent to power is something short of phenomenal. He made himself known as a political freshman. As a sophomore, he led the unseating of the reigning party that had been in control for the last 36 years. By the third time an election faced him, Lougheed laughed it away, and in the following phase of his election years, he almost made it embarrassing to be a member of the opposition. According to Gwyn, the only thing that is now keeping Lougheed from graduating from provincial politics is the battle with Trudeau over oil and gas revenue sharing, which he is determined to fight until he wins [151].

Lougheed's success can be attributed to the late urbanization of Alberta. The percentage of the population living in urban areas increased from only 31.1% in 1931 to 63.9% in 1961. This trend has continued with the emergence of Calgary and Edmonton as vital financial, industrial and political centers of the West. Lacking the agricultural heritage that formerly kept the people of Alberta out in rural districts, the majority of immigrants now coming into the province choose to establish themselves in these cities. "The growth of the Conservative vote in Alberta's major urban centers has been far more rapid than for the other parties, to the point where the Conservatives are now the dominant urban party [152]." This analysis pertained to the 1971 election, when the Tories came to power. The trend has not changed, and the very strong correlation between the percentage of people living in cities in Alberta and the popular vote for the Conservatives persists.

But this analysis of urban support is somewhat misleading, as House points out in his socio-political study, "The Last of the Free Enterprisers: the Oilmen of Calgary." In terms of economic, religious and political standards, their beliefs "lead to a preference for the Progressive Conservative Party. It should be noted, however, that many oilmen feel that no current political party fairly represents their views and interests -- they are all too 'socialistic [153].'" Lougheed's purchase of Pacific Western Airlines, and his creation of the Alberta Energy Company are given as examples of the trend to socialism. So, in terms of the political spectrum, Lougheed has probably, in their opinion, set his platform somewhere just slightly right of center. His constituents, at least the affluent oilmen and resource concerned

businessmen, regard the Tories in Alberta as the least drastic of all alternatives.

"Some respondents pointed out that, although they supported the Progressive Conservative Party, they did so merely because they considered it to be the least of three evils. From their perspective, Pierre Trudeau was only slightly less socialistic than David Lewis, and Peter Lougheed was not far behind! [154]

Their views on individualism, risk-taking and the notion of fair returns, competition, profits and efficiency, the limited role of government, bureaucracy, welfarism, and the decline of the work ethic, however farther right of Lougheed, are nonetheless consistent with those beliefs espoused by the people of Alberta in general as developed in the historical pattern outlined by Pratt and Richards, and Hyndman [155].

The popularity of the Conservative Party is focused on one man, Lougheed. The political structure or hierarchy or interactive formation of the conservative association indicates this. There is no reason to believe the same is not true of the government. Foster provides an appropriate example:

"Examining the power structure in Alberta is like peeling back the layers of an onion. Each layer fits, but comes away easily. There are no great conspiratorial connections. The seeker for the centre of power is left with a single man, Peter Lougheed, who very clearly believes that his political position sets him apart. Other segments either fit themselves around Lougheed's central concept, or else have no part in the great shape of things."

His cabinet ministers and the important people he works with are loyal, equally devoted to the same goals, and perhaps by some mystical osmotic process, have the same propensity for hard work. Foster describes how Lougheed and his former Energy Minister Don Getty "formed a two-man hit team, working out their strategy for

dealing with the federal government and the oil companies." And yet, when the Alberta Cabinet meets, the atmosphere takes on the flavor of a corporate boardroom, with Lougheed as its chairman [156].

Lougheed, however, is well capable of "managing" the province, and does delegate and recognize the authority of his colleagues. One of his first goals has been achieved; where his ministers formerly met with federal deputies, and Lougheed himself met with federal ministers, his steadfast refusal to allow this to continue has achieved results: meetings between federal and provincial officials now take place on an equal basis. Important symbolically, this was just a single demonstration of Lougheed's attempt to assert fully the "whole case for western equality (and then some) [157]."

Yet Lougheed is more than just a premier of Alberta. Neither Premiers Bennett or Blakeney, from British Columbia and Saskatchewan respectively, have so consistently and vehemently dared to rile and challenge the federal government. He almost certainly recognizes the significance of his position, not only as provincial premier as Foster noted, but also as the leader of the West. With strong representation of every party except the Liberals at the provincial or federal level in the West, and as the overwhelmingly favored leader of the province that produces 85% of the nation's oil, Lougheed realizes the unique opportunity provided him by his position to do "the moral equivalent of war" with Ottawa.

The Northern Magus

His tenure in political office has been an exercise in the consolidation of federal executive power. Virtually every political reference on the Canadian federal system will remark, with some degree of explicitness, that Trudeau's career has been a search to stretch the limits of democracy.

When we consider that Canada is a democracy, we must place the structure and modus operandi of its government in perspective in order to judge fairly to what degree it does function as a democracy. Of the bulwarks of democracy, Britain and the United States have served most often as examples to be replicated. While the Canadian federalist system was modelled after the British system with modifications made for the sheer size of the country, it cannot be said that the two are alike. "The Cabinet-dominated government in Britain today differs greatly from that in Canada, especially since the British Prime Minister is subject to more political constraints than the Canadian counterpart [158]." Campbell goes on:

Trudeau also fed talk of presidentialization by relying heavily on organizational structures designed to serve the Prime Minister and the Cabinet. These structures appeared to give Trudeau immensely greater capacity to modulate his image, monitor operational departments, leave his mark on substantive policy decisions throughout the government, and win strategic battles with the bureaucracy, Cabinet and Parliament [159]."

Campbell attempts a modest defense of Trudeau's actions by presenting them as a natural extension of the policies of Trudeau's predecessor, Lester B. Pearson. When one develops an appreciation of the Trudeau character as offered by Gwyn, it is clear that Trudeau did not merely "accelerate" (as Campbell puts

it) the process, as Pearson left it for him to do, but rather abused it. Since Campbell does stress the fact that "change depends on who is at the helm and what mood he is in," he is in fact discreetly supporting Gwyn.

If one examines the structural organization chart of executive leadership under Trudeau, there is a strange upward flow of arrows that point to either the Prime Minister himself or councils and committees which he chairs. One does not have to be a sophisticated political technocrat to realize that the Prime Minister carries not only a great deal of responsibilities, but also a lot of influence [160].

Parliamentary government as it is known in England and Germany and the United States essentially services the legislative proposals of the Cabinet. The Cabinet, which is selected by the Prime Minister, is the instrumental forum for policy initiation and formulation. Although, unlike British ministers, all Canadian ministers are members of the Cabinet, there are some ministers who are "more equal" than others. Trudeau's inner circle is well known to Canadians, and that his friends have come to occupy those ministries "more equal than others" should come as no surprise--Gwyn explains at length the manner in which Trudeau has reinforced and bolstered his own position by turning the important portfolios over to his comrades. The two particular ministries that in their own indirect way have had an influence over the development of the tar sands have been finance and energy, where the above statement holds even "more equally" true than for others.

Finance and energy are the two portfolios that capture most of the public's attention. Lalonde and MacEachen, their respective ministers, having endured over the years with Trudeau, still remain among the last surviving members of the Trudeau clan active in Ottawa. This in itself is a heroic feat, but, then again, one can never be sure if they chose to remain with Trudeau out of sheer, unabashed loyalty, or out of unrestrained stupidity; several of their predecessors, such as Turner, MacDonald, Fox, Lang, etc. opted for a more subdued, private life, leaving the ship, so to speak, before it started to sink. Several, such as MacDonald and Turner, have been tempted by the thought of a return to politics, certainly MacDonald, but their hibernation will only cease when the Northern Magus has retired.

As Lougheed has constructed a team of loyal teammates, so, too, must Trudeau be seen as an effective recruiter. Lalonde brings with him a fiery tongue and a temper to match, and Trudeau's feelings vis-a-vis the West are very much reflected in what Lalonde says and does. Gwyn describes Lalonde as Trudeau's hatchetman, "the toughest guy on his (Trudeau's) team [161] his equal in intellect and Trudeau's superior in stamina. In many ways, the closeness of the Trudeau-Lalonde alliance parallels that of Lougheed and his cohort, Merv Leitch, Alberta's present energy minister.

MacEachen is no less loyal, but not nearly as outspoken as Lalonde. From the information gathered for this paper, it cannot be said that MacEachen made any great effort to invite controversy or argument. Nevertheless, his ability to translate Trudeau's desires into acceptable policies, as far as Trudeau is concerned,

has left MacEachen in a stepping stone position for the leadership of the Liberal Party when Trudeau retires.

Trudeau's political record lacks the glamour and consistent upward trend of Lougheed's, even though the two have been in power for approximately the same length of time. Trudeau's wavering popularity has been evidenced by the fact that he has twice been reelected with a minority government. Moreover, that the basis of his support is from Quebec can hardly be considered indicative of a country-wide feeling that he is the best man to govern the country. In the 1980 election, his share of the popular vote was only 22% [162], one third of Lougheed's. Perhaps because he does derive a disproportional amount of political strength from the East, and lacks the national representation, Trudeau has felt it necessary to consolidate the powers of the federal government to provide reinforcement against possible opposition from those regions where he lacks political support.

The need to win a struggle over a policy is very dear to Trudeau. Gwyn might say it was an obsession: "Since boyhood...Trudeau has never lost a single fight. Always, for him, winning has been the only thing; each victory another triumphal demonstration of his virility." The election loss of '79 was seen by Gwyn as a great psychological blow to Trudeau, but his victorious reemergence soon thereafter reaffirmed him. In a sense he had not only been reaffirmed, but also aggrandized; like Ali, Trudeau proved he could come and win from behind. Gwyn dubbed him "Trudeau Resurrectus [163]."

The apparent Trudeau mania for winning is an important factor in the constitutional debate over natural resource ownership,

revenue sharing and pricing. If we assume that Trudeau is just as aware of the impending oil situation, as it has been outlined above, as Lougheed is, one is left wondering why he chose to continue to act on behalf of the Ontario people (the only ones whom he essentially represented), by keeping prices low, and endangering the long term security of oil supply from within the country. The National Energy Program is clearly in keeping with Trudeau's election promise; it keeps prices lower than those proposed by the Clark government. But Trudeau was aware of what was acceptable to Lougheed before the NEP was introduced. One can therefore surmise that the NEP was intended to irk Lougheed. To have done anything less would have been acquiescing to Lougheed's demands. Trudeau knew what the implications of the NEP would be: higher oil import costs and all their negative economic effects, reduced domestic conventional oil activity by the industry, and Lougheed's withholding of approval for the tar sands projects and curtailed production. What is disturbing about this thought is that Trudeau was not willing to forgo the opportunity to deny Lougheed a victory, even though it would be won at the long term expense of the Canadian people. Trudeau's record in government shows numerous examples where he balked from fulfillment of an election promise, for what he thought was the economic good of the country: wage and price controls in the mid-seventies is perhaps the best. With a solid majority in Ottawa, Trudeau would have experienced no difficulties in passing a National Energy Program amenable to Lougheed. This would have avoided all the complications, confrontations and threats. As a true federalist, Trudeau would have avoided this. But his burning desire, so amply described by Gwyn, and his elitist, superior, condescending atti-

tude forbade him to yield. Trudeau had exercised his authority over political appointments "to optimize the political payoff of such patronage [164]." With the imposing host of the Prime Minister's functions [165] Trudeau would cash in on this patronage, and flex his muscles for one last time. He had been soundly defeated by Lougheed in earlier energy negotiations; the revenues accruing from Syncrude to Alberta, and the sheer size of the Heritage Fund were proof enough of that. He would not allow himself to be "screwed" again.

Lougheed and Trudeau both thrive on the opposition provided to each by the other. Each sees his mandate as one that must be defended to the hilt and for which there can be no compromise. Each accuses the other of inflexibility, and of making insignificant offers for negotiation. One Canadian oil company executive called Lougheed and Trudeau both "offside." On the lower level side, MacDonald said of Lalonde and Leitch that they were "equally stubborn." With the two teams in self-righteous limbo, the petroleum supply shortage in Canada approaches even more rapidly, as the long lead time that is required for the tar sands projects is prolonged even more by political indecision. The economics of the projects would allow them to proceed without political interference, although not without difficulties.

One writer chose to express his frustration with the provincial and federal governments' bickering, with the phrase: "Oil and politics, like oil and water, do not mix." Unfortunately, he is wrong; like the tar sands of Alberta, not only have oil and water mixed, but so have oil and politics. The problems with oil politics are much the same as with oil sands: each poses a host

of problems that must be separated and treated before the final product can emerge. In the case of the tar sands, the product is a highly desirable synthetic crude; in the case of politics, it is a coherent and realistic energy policy intended for the long term benefit of the country. But like the total Syncrude process, where the project involves everything from downstream (mining) to upstream (hydrotreating) operations, energy problems must be dealt with on a fully integrated basis. The oil sands men understand this. The politicians do not.

12. Self-Sufficiency Reassessed

Self-sufficiency in oil by 1980 was Trudeau's stated goal in 1974. This goal was not reached. In the latter half of the seventies, politicians were calling for self-sufficiency by 1990. Now, even this goal appears unattainable. Trudeau seems to think that the country will be lucky if it is self-sufficient in oil by the end of the century [166]. And yet, the situation at hand was recognized very early,

"In December 1972, the National Energy Board published a preliminary report on the potential limitation of Canadian petroleum supplies. In assessing the tar sands, NEB pointed out the capital-intensive nature of developing this resource and the significant delays which could result if the industry suffered from a shortage of capital, lost confidence in the economy or felt itself unduly hampered by royalty and taxation regulation [167]."

The development of the tar sands rests to a great extent on the successful completion of the Alsands and Cold Lake projects. They alone will not be able to bridge the gap between increased demand and reduced production of conventional oil, but they nevertheless represent a crucial start. The Alsands consortium members have seriously considered shelving the project (yet another time); Cold Lake has accepted an offer made by the federal government to give Imperial a \$40 million loan to finance the project further while the federal and provincial governments come to an agreement. The loan is repayable with interest if the project proceeds; if it does not, then Imperial will have avoided the risk of having invested more funds in an unsuccessful project. Alsands dismissed the government offer, saying that it did not want any hand-outs, but rather firm and final commitments. It gave the two governments until June of this year to come to

terms. The Alsands position in this instance does not mirror the Syncrude situation in any way, since both governments have long since been aware of what the project's consortium members want [168].

Lalonde considers his loan offer to Imperial as putting pressure on the Alberta government, but this mode of analysis is superficial; the tar sands projects can and will be delayed, if necessary, by Lougheed until he is made an acceptable offer. Sooner or later, when the conventional oil wells run dry, and the producers have insufficient funds with which to finance higher cost oil enhanced recovery techniques and tar sands development, the situation will become desperate enough. Then the federal government will have little choice but to give in.

The cost of all this delay, of course, will eventually be borne by the consumer. When the high cost replacements of conventional oil come onstream in the form of increased imports, tar sands, or frontier oil, prices will escalate rapidly to reflect the producer and user cost of oil. All indications of industry and market reaction to the NEP point to a situation where Canada will have to rely on substantially increased imports at least up until 1990. As a result of political infighting and indecision, the country will suffer economically the loss of whatever autonomy over oil prices it could have assumed by reaching self-sufficiency earlier than now appears imminent.

The Canadian view of energy was not radically altered during the seventies. Canadians would prefer to hear from politicians that energy prices will be contained, that they will be the ones who will benefit over the short term, and that who will bear the

cost and how much each will have to bear is irrelevant. "Canadians don't believe that there is a (energy) crisis, or that we face shortages. Small wonder, then, that politicians are reluctant to face up to the problems squarely...that they skirt the problem by attacking oil company profits, foreign ownership and so on [169]." Furthermore, as long as it is not politically expedient to campaign for higher energy prices, even though it could provide economic benefits to the country as a whole that may be several times the amount spent, self-sufficiency will elude Canada. The means are certainly there in the tar sands to exploit an opportunity that is virtually unparalleled in the world. But the will to do so has not yet been sufficiently provoked by need.

13. Recommendations

The development of the tar sands has experienced an arduous and uneven history. Initially, it was the geographical location and geological characteristics of the tar sands that prevented their exploitation. When these problems were theoretically and practically vanquished, it became a question of whether the theory and the technology could economically implemented. The last but highest barriers still have to be overcome; they are political and they are man made. Eventually they too will be overcome, and the development of the tar sands will proceed.

It is not so much a question of whether the tar sands will be developed, as much as it is how easily they can be developed. The transition from low to high cost petroleum sources will doubtless be a very economically trying period, and every effort should be made in order to alleviate this. In approaching this issue, I will deal with those three parties that will most directly continue to be involved in the development of the tar sands.

The Oil Industry--There is very little that can be suggested to the oil industry that it has not already attempted to do or is not doing already. Having overcome the basic technological difficulties, although many still persist, the industry is in a position to proceed given the green light from the two levels of government to do so. In order to coax such a signal, industry has amply demonstrated its willingness to spend in the national interest. It has made available vast sums of capital and expertise that have enabled the technological and economical extraction of oil from the tar sands, the benefits of which will be en-

joyed by all Canadians. It can do little else but to continue to educate the people who do not realize that the need for oil is not around the corner, but around the block. Because of the enormous quantities of capital and lead time that are required to develop and secure the new supplies, oil industry spokesman will continue to urge people to invest in their futures, both economically and politically, by paying higher prices over the short term so that the costs can be amortized, and by supporting political parties who espouse realistic energy policies. Meanwhile, without incentives and without adequate signals from the market and the government, they will do little else but wait.

The Alberta Government--From the evidence presented above, I have tried to show that Lougheed's position on conventional crude is justified, while his stance on unconventional oil needs to be modified. Lougheed is quite right when he says that the price of oil is no less valuable now just because it was found earlier. Not only he, but several people I spoke with in Alberta, cited the exponential rise in gold prices which more or less accompanied those of oil. Canada itself is a gold producer; the production takes place mostly in Ontario, and this gold is sold for the going world price. The value of Ontario gold, Lougheed and his supporters are implying, is now more valuable than before; therefore the same should be true for oil.

But Lougheed's claim has more justification than just this simple comparison. The people of the West, given their cultural heritage and the history they have endured, have a right to insure themselves against every possibility of the great poverty and alienation ever occurring again. This will be achieved in two

ways; firstly, through a substantial rate of savings, and secondly, through a substantial amount of reinvestment both in the primary sources of resource wealth and in the secondary downstream sources of value-added processing. The case for higher oil prices is particularly sound for reinvestment in tar sands development, where the higher prices for the existing "inventory" will be used to finance and make possible the next generation of oil sources.

Lougheed would do well to subdue his expectations of a continued share of royalties and profits such as those negotiated with Syncrude. Since the history of tar sands development has been more than fiscally favorable for the province despite the responsibilities it has been asked to undertake in return, and concurrently the federal government's return on its contribution has been marginal, it would be in the best interests of orderly and progressive tar sands development if the province of Alberta would not come into future negotiations "shooting from the hip," as Pratt has put it. In short, the federal government's share should be more recognized.

As one of the most vigorous proponents of curbing the central power of the federal government, Lougheed could point to the German example of federalism, where the Laender (provincial bodies) are represented in the Bundesrat, and have the constitutional authority to veto what the German parliament, or Bundestag proposes, as a concept that should be incorporated and institutionalized into the Canadian political system. This way, the provinces would not only be represented at the national level, but executive federalism could be restrained. Policies that would emerge from such a governmental body would better serve the in-

terests of the nation, rather than regional interests, as a discussion of this paper has shown.

The Ontario Government--Premier Davis, as a Progressive Conservative premier supporting a federal Liberal platform, has seriously undermined his credibility as a serious politician. The Ontario government's share in Syncrude has now been sold out, and the government of the most oil dependent province in Canada is left without any sort of equity participation in Alberta. This is both hazardous and provocative. By taking sides with Trudeau, Davis has allowed Lougheed to point an accusing finger at the province, and there should be no reason to believe that Lougheed will go out of his way to strike a deal on Ontario's behalf. The inter-provincial rivalry has already begun, with not only Ontario and Alberta setting up economic barriers [170] that inhibit the flow of goods and services, but with other provinces doing the same as well.

Keeping in mind that the oil belongs to Alberta, and that the supply is not controlled by Ontario, one can liken the situation in Canada as a microcosmic equivalent of the present international system. Alberta is indeed like Saudi Arabia, and Ontario more like Japan. There are major differences, of course. Ontario has become greedy, and is using up energy at a vociferous rate. Despite its industrial energy input advantage over other nations, the industrialized economic base of Ontario has proved that it is both inefficient and unproductive. Lacking the proper incentives, it is hard to believe that Ontario will make the necessary economic adjustments to compete more efficiently in export markets until the price of oil is significantly raised. Per capita

consumption in Japan and Western European countries is approximately half that of Canada's (most of which takes place in Ontario), but the price is twice as high, if not even more. Price elasticity of oil demand has been proven, but for Ontario this has not yet been the case. Unless Ontario wants to carry an even greater financial burden when either higher priced imports of tar sands production come to market, it should accept politically and economically the consequences of higher oil prices over the short term, so that the costs can be spread out. It is irresponsible for a province such as Ontario, and even more so for its government, to believe that it has the right to squander the non-renewable resources of another province. It would be equally irresponsible to do so even if the province owned the oil itself.

An encouraging sign is the call for higher oil prices by the Manufacturer's Trade Association of Ontario, which would like to see the federal-provincial conflict resolved, so that business could go on as usual. They have identified themselves as profligate users of energy and realize the need to reform. More importantly, however, they have realized that as a province receiving oil from another province within the same confederation, the supply of their oil is secure. With the issue of separatism aside, the relationship between Ontario and Alberta would be mutually beneficial: Alberta still finds its main markets in Ontario, and Ontario finds its sources in Alberta. But oil, however safe within the country, is still a seller's market, and Alberta reserves the right to either sell the oil, or to leave it in the ground. Ontario has implicitly ignored the aspect of security of supply like Japan has, and is oblivious to the fact that countries such as Japan and Germany and France, who find themselves

in much the same position as Ontario, pay premiums for secure supplies of oil.

Former Alberta energy minister Don Getty put it in a comparative perspective:

"Getty says he can't understand opposition in Ontario, the major energy consuming province, to pricing proposals that would give that province oil and gas prices far below world levels. He notes the oil price would rise gradually (under the Lougheed scheme) over several (three) years to 85% of the Chicago price, and gas would be sold to new Canadian markets at 65% of the world oil price.

He says that any other nation in the world would be happy to acquire petroleum supplies under similar terms.

"Some of my friends in Germany and Japan say they can't believe they're fighting over this," according to Getty [171]."

Ontario can take example from these countries by ceasing to look at the tar sands of Alberta as a short term high yielding investment. Instead, increased equity and or research participation in the tar sands will not only foster good relations between a producing and consuming province, but also will provide a direct source of oil for the province; Ontario, while it was still a participant, received 5% of Syncrude's output of synthetic oil. This argument certainly seems to hold true for the Japanese people: aware of the fact that Canada has an explicit policy against oil exports, the Japanese are nevertheless hopeful that their agreement with AOSTRA [172] to invest at least \$75 million in tar sand recovery programs will result in a reversal of Canada's export policy. For the Japanese, who now have no hope of securing oil supplies from Canada, the tar sands are attractive enough to risk such an amount of money; to Ontario, who

will need and depend on the tar sands to a much greater extent than anyone else in the country, let alone Japan, the tar sands are insignificant.

Lastly, the people of Ontario will have to accustom themselves to the growing wealth and influence of the West, and Alberta in particular. Alberta's aspirations for an industrial base are justified, and if they are successful in outbidding Ontario for attracting manufacturing and industrial concerns to Alberta, then so be the power of the marketplace.

Unless the government of Ontario twists the arm of the people by forcing them to take the bitter medicine of higher oil prices, their condition, which is presently dormant but malignant, will deteriorate. Lougheed will then have little choice but to give them the medicine.

The Government of Canada--Since the government of Canada is embodied by essentially one man, these comments will be addressed to Trudeau. Trudeau must first realize that his election victory in 1980 was not so much a victory for him as it was a loss for Clark. Gwyn has shown that the Liberal's popularity prior to the Conservative budget's defeat, but after Trudeau's announcement about his intended retirement, was sufficient to have allowed any Liberal candidate to win the election over Clark. Secondly, Trudeau must realize that his is definitely not a nationally representative mandate, and that in such a limited position, his effectiveness would be increased, and his political esteem heightened, if he were to work with those whom he has opposed rather than against them.

In addressing the conflict over energy with Lougheed, Trudeau can rectify many of the ills created by the National Energy Program. There are many specific points of contention.

The issue of "Canadianization" as the NEP calls it, or "outright nationalization" as Turner described it, needs serious review. The federal government's role in the petroleum industry is laudable, but not consistent with its intended goals. Canadians now own approximately 30% of all oil company equity in Canada. Trudeau's goal is to make this 50% by 1990. Petro-Canada is supposed to lead the way by acquiring several foreign controlled companies now in Canada. In a decade during which the country will require vast amounts of foreign capital to make up for what Canadian savings cannot supply, the National Energy Program will result in the acquisition of companies that would otherwise be willing to provide this capital. Secondly, the transfer of savings that would have gone into future energy sources such as the tar sands will flow instead into existing stock equity, thereby also aggravating the need for capital. The NEP is crowding out the capital markets with which the oil industry will have to finance new capital intensive projects such as Alsands and Cold Lake. Canadianization is a disincentive for foreign investors to risk their money in Canada.

The case of Suncor is a good example where the effect of a NEP policy differs from one of the Programs goals. Before the NEP was introduced, Suncor was planning a stock offer to Canadians in the interest of conforming to the government's objective of greater Canadian ownership. Now, largely because of the NEP's decision to retract world prices, Suncor's profitability has been

severely cut, and the attractiveness of the stock offer has been proportionally diminished.

The rate at which Petro-Canada is proceeding, and receiving support from the federal government to achieve its mandate is what alarms most oil industry executives. Most believe that Canadianization will be achieved before 1985 at the present rate. The rocketing power of the state oil company is actually the focus of Pratt's present attentions. Asked if he felt that Petro-Canada's proposal to build a tar sands plant in Alberta, and to take on a greater presence in the tar sands as a whole would accelerate development of the tar sands, MacDonald surprisingly replied that he did not believe the Alberta government would approve Petro-Canada's project, and that its role in the tar sands would more or less be limited to minority equity participation. Lougheed, he doubted, would allow himself to be steam-rolled by Petro-Canada over what was his last ace in the hole, the tar sands. It would therefore be incumbent upon Trudeau to brake the inertia Petro-Canada has recently built up, before it becomes "an uncontrollable giant," as Pratt described its potential.

For Trudeau to establish credibility with future investors and developers of the tar sands, he should seriously reconsider his rescinding of world prices for Suncor. Oilmen wonder at the government's actions towards the pioneering company; instead of showing the least bit of thankfulness or gratitude to Suncor for having made the effort, for having taken the risk and having incurred substantial financial losses for almost a decade, the federal government has moved to effectively punish it. What Trudeau once again failed to realize was that he was destroying his

own image even further among those people whom he should have made the greatest effort to accommodate.

On the issue of pricing, what has already been said and implied should be encapsulated in a summary. Trudeau is overstepping his mandate, and is wreaking havoc with the electoral timetable. He has inauspiciously timed the bigger oil prices to take place well after his "intended" retirement in 1983 or 1984. One is therefore also tempted to think that in 1984, when a general election will be due, Trudeau might reveal himself once again eligible for reelection, and will campaign, in front of the people of Ontario at least, that he has given them the significant benefits of producer cost oil prices rather than the artificially inflated cartel induced world prices, and that, if reelected, he would make sure that the status quo remained. His actions to time the price increases in this way are equally irresponsible if he does decide to retire, since then the party in power when the higher prices do come into effect will most certainly be blamed for them by the voters' perceptions, and will be punished with their ballots.

Gwyn said of Trudeau: "When it comes to the hardest issues, those involving the economy and energy, he has been strikingly timid and conventional [173]." Indeed Trudeau has done what comes most easily to him: to use the fortress of government he has built up for himself to defend against the opposition in his own aggressive way. If Trudeau were to truly prove his "virility," he would open the doors of his fortress and be prepared to fight Lougheed on the plain. Trudeau could adjust the the National Energy Program, which he originally "hoped to ram down Alberta's

throat [174]," and minimize the long term effect to all Canadians (and not just a few) that would occur after his tenure expires. Trudeau could then take pride in himself for at least having once played fair [175], for having at least once tried to overcome his timidity in dealing with a difficult issue, and lastly take pride in the thought that history will judge him less harshly than it might otherwise.

14. Conclusion

The purpose of this paper has been to outline a history of tar sands development, to refute logically those arguments which have been presented against their development, and to discuss some of the problems which will continue to obstruct the development of the Alberta oil sands, in which lies Canada's greatest opportunity to become self-sufficient in oil.

Canada is fast approaching a situation which could have long term detrimental effects on its ability to control its political and economic destiny. Although Canada is a net exporter of energy and is energy self-sufficient, its position in terms of petroleum self-sufficiency is not nearly as positive. When the reserves of conventional oil are depleted, there will be little choice but to turn to high cost sources of oil supplies to replace them. Imported oil does not pose a viable alternative, because their costs are just as high as domestic alternatives, and they have additional negative effects on the balance of payments, government spending, and the value of the Canadian dollar. Furthermore, dependence on politically unstable sources of oil supply would handicap the country's sovereignty, and would result in a net outflow of economic benefits that are greater than just the nominal value of the imported oil.

Frontier oil is still at a point where it will require large sums of capital, and several years before it will have reached the production stage. Constitutional complications plague the Hibernia field off Newfoundland, while transportation and or delivery infrastructure deficiencies stifle the development of the Beaufort discovery in the Arctic. Conservation and substitu-

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tion effects are presently not occurring due to an insufficient price incentive. Demand for oil will continue to grow in real terms as the supply of conventional oil dwindles. The present situation indicates a reprieve from a drastic petroleum supply shortage of approximately ten years, but because petroleum makes up such a large percentage of Canadian primary energy consumption, and development of alternative sources requires long lead times, the need to expeditiously begin active realization of these new sources is much more immediate than the "reprieve" actually allows.

The tar sands of Alberta, with deposits holding reserves of oil larger than almost any other in the world, are the domestic alternative that will most likely become the source by which Canada will be able to achieve a good deal of its oil self-sufficiency. Even though the geological composition of the sands is such that more than half the reserves will probably not be extracted, the ultimate recoverable reserves are still larger than the largest oil field in Saudi Arabia, and hold enough oil to meet the total demand for oil Canada for decades to come.

There are, nevertheless, numerous problems to developing the tar sands, which for the most part have been solved, but that still need considerable refinement. If the tar sands are to be developed efficiently, then multi-billion dollar projects with large economies of scale will have to be constructed. Experience has shown that a substantial rate of throughput must be maintained in order to keep a project profitable. Other, less significant problems, such as the relatively primitive use of technology, and the environmental and socio-economic impact of these

large plants are being addressed. The necessary controls, such as the AERCB and AOSTRA, have been instituted to ensure that these problems will continue to receive attention and that improvements will result.

The advantages offered by the development of the tar sands are manifold. First and foremost is the continued security of a long term source of crude oil. Secondly, the maximization of domestic equipment purchases and use of skilled and unskilled manpower will provide a helpful stimulus to the Canadian economy as a whole. The fact that the actual extent of the tar sands has been located and mapped is an advantage which they have over the development of frontier sources of oil. Lastly, by developing new technologies for oil sands extraction, the Canadian synthetic oil industry will be in a strategic position to compete with other continental and global sources of heavy oil as the world's reserves of conventional light crudes are exhausted. Moreover, as a pioneer in heavy oil extraction with a substantial lead over other heavy oil technologies, Canada will easily be able to export technology, which should act as an added impetus to domestic technology development.

The oil sands have seen a host of geologists, inventors and entrepreneurs attempt to extract the oil with varying degrees of success. Commercial production began with Suncor, which served as a prototype to future tar sands producers on what to do and what not to do with respect to actual tar sands extraction and upgrading, as well as on how to deal with government. Its successor, Syncrude, experienced unforeseen problems that did not happen to Suncor. The consortium members, in an effort to solve a cost

problem with the help of the provincial and federal governments, roused the curiosity of several leftist political analysts, who hypothesized at a most inopportune time that the whole affair had been a conspiracy, and that there had been a significant amount of political manipulation by the companies. These theories, history has proven, are unfounded, and leave much to be desired.

Rather Syncrude has served as a second example of tar sands development that will provide future producers, such as Alsands and Cold Lake, a relative insight into the different outcomes of tar sand production and negotiations with governments.

For their part, the oil companies are prepared to continue development of the tar sands, but they have found themselves in the uncomfortable position of being held as political hostages. The defeat of the Conservative Government and the subsequent reelection of a Liberal government, which found the former government's energy deal unacceptable, has stalemated the progress of the tar sands developers. The political issue at hand involved more than just the tar sands; it revolved around the more basic notion of a price for energy, and how the price was to be divided. These issues, in turn, are more fundamentally tied to basic social beliefs and value systems that have caused the country to be ideologically separated, and this separation has manifested itself in both the federal and provincial political scenes. The principal actors in the dispute of these issues involve highly motivated and unususally strong personalities, and resolution of the dispute does not appear to be in the immediate future.

For the most part, Canadian self-sufficiency in oil will continue to remain an enigma as long as the future security of

oil supply is mortgaged for short term political and economic gains. The development of the tar sands now faces a problem which it will most certainly encounter more and more often in the future. Political interference and indecision are factors over which the producers, the actual developers of the tar sands, have no control. Until the Canadian political will can find a compromise to its differences, the tar sands will be asked to forfeit their unique contribution to Canada's energy quagmire.

15. Endnotes

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72. Gray, p.305. (p. 66)
73. As cited from Pratt, p.? (p. 66)
74. Walwyn, p.7. (p. 67)
75. Taken from the Alberta Government Policy Statement, Part 1, October 1962, as an appendix to Walwyn. (p. 69)
76. Pace Company Consultants and Engineers Inc., Synthetic Fuels (Denver: Rocky Mountain Division, December 1979). (p. 70)
77. Business Week (June 2, 1980). (p. 70)
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79. Petroleum Economist (January, 1979). (p. 71)
80. Walwyn, p.27. (p. 72)
81. May, p.95. (p. 72)
82. The tone of House's work is leftist, whereas that of Laxer simply cynical. Their arguments on the Syncrude affair and the tar sands in general may be found in: House, J.D., The Last of the Free Enterprisers: The Oilmen of Calgary (Toronto: MacMillan Company of Canada, 1980), p.130, and Laxer, James, Canada's Energy Crisis (Toronto: James Lorimer and Co., 1975), p.106, pp.156+. (p. 75)
83. Pratt believes that, since the governments put up the actual working capital, they should have been entitled to more than their share of corporate power. He notes that Imperial's share is conveniently greater than the sum of the governments' shares. Whether or not the governments put up the effective working capital is a contentious issue, and if the arrangement had been as Pratt suggested, then the ensuing ownership changes would have been highly complicated, if not altogether impossible: boardroom directorships would eventually have had to reflect equitly interests in the project. (p. 75)
84. Foster, Peter, The Blue-Eyed Sheiks: The Canadian Oil Establishment (Toronto: Collins, 1979), p.83. (p. 76)
85. In the interview with Dr. MacFadyen, when discussion moved to the May paper, he smiled, gave me a copy of the May-Helliwell paper, and informed me that it was probably a clearer version of the one May had written. Who was Helliwell? Besides a socialist economist also at UBC, he was "May's mentor." (p. 78)
86. Helliwell, John and Gerry May, "Taxes, Royalties, and Equity Participation as Alternative Methods of Dividing Resource Revenues: The Syncrude Example." in Natural Resource Revenue: A Test of Federalism (Vancouver: University of British Columbia Press,

- 1975). (p. 78)
87. Helliwell and May, p.158. (p. 78)
88. Helliwell and May, p.178. (p. 80)
89. Syncrude Canada Ltd. The Syncrude Story (Edmonton: Public Affairs Department, 1980). (p. 83)
90. Synthetic Fuels (September 1977), p.3.19. (p. 83)
91. New York Times (October 11, 1980), p.D1. (p. 84)
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94. Petroleum Economist (December, 1979). (p. 89)
95. AERCB, Alsands Fort McMurray Project. (p. 91)
96. Foster, p.69. (p. 93)
97. Dominion Securities, Industry Review: Heavy Oil: Prospects and Participants (Toronto, 1980), p.3. (p. 94)
98. Walwyn, p.26. (p. 94)
99. Walwyn reported that a Shell Canada in situ plant had achieved an operating efficiency of well over 50%, but made it clear that it was doubtful whether this rate would be applicable for commercial projects; p.24. (p. 96)
100. Canadian Petroleum (May, 1980). (p. 96)
101. Foster, p.68. (p. 97)
102. Oil and Gas Journal (December 24, 1979), p.37. (p. 105)
103. Globe and Mail (February 16, 1980). (p. 106)
104. Globe and Mail, (February 16, 1980). (p. 107)
105. Globe and Mail (February 20, 1980). (p. 108)
106. Saturday Night (Toronto: New Leaf Publications, November, 1980). (p. 109)
107. Business Week (June 9, 1980). (p. 110)
108. Northern Miner (April 3, 1980). (p. 110)
109. Gwyn, Richard, The Northern Magus: Pierre Trudeau and Canadians (Toronto: McClelland and Stewart, 1980), p.343. (p. 111)
110. Globe and Mail (February 16, 1980). (p. 113)
111. This prompted editorials in American newspapers sarcasti-

- cally thanking Canada again (so soon after Ken Taylor had aided the Americans in Iran), but this time for helping them out with their energy problem at Canada's own expense. Essentially, Trudeau had made Canada the laughing stock of the western hemisphere. *Denver Post* (November 9, 1980), Rukeyser. (p. 117)
112. Mutual Life Assurance Company of Canada, Proceedings and Addresses (Toronto: February 25, 1981), p.2. (p. 120)
113. Simeon, Richard, "A Citizen's Guide to the Constitutional Question" in Business Council on National Issues (Toronto: Gage Publishing, 1980), p.40. (p. 120)
114. Smiley, D.V., Canada in Question: Federalism in the Seventies (Toronto: MacGraw-Hill Ryerson, 1972). (p. 121)
115. Smiley, p. 60. (p. 121)
116. *Business Week* (August 18, 1980). (p. 124)
117. *Globe and Mail* (November 28, 1980). (p. 127)
118. A Texaco Canada memorandum circulated in the head office warned in August, well before the NEP, that the powers the Alberta legislature had granted itself, implied that "in the extreme, it would allow the Alberta government to shut-in 80% of Alberta's production." (p. 127)
119. *Globe and Mail* (October 17, 1980), p.B7. (p. 128)
120. *Oil and Gas Journal* (September 25, 1980). (p. 130)
121. *Oil and Gas Journal* (February 21, 1980). (p. 132)
122. Reported in *Globe and Mail* (January 1, 1981). (p. 132)
123. *Northern Miner* (October 2, 1980). (p. 134)
124. Bellamy, R.E., p.11. (p. 134)
125. *Oil and Gas Journal* (November 21, 1977). (p. 134)
126. *Oil and Gas Journal*, (November 28, 1977). (p. 135)
127. Canada, National Energy Program 1980. (p. 138)
128. Canada, National Energy Program 1980, p.112. (p. 139)
129. Foster, p.254. (p. 141)
130. *Business Week* (May 26, 1980). (p. 142)
131. The basis of this argument rests on an article written by a former Tory Minister of Industry, Trade and Commerce in the Clark government, M. Robert R. de Cotret. The state of the government's finances was not one which the Liberal government preceding the Tory government cared to publicize. Cotret's piece, appearing in the January 1981 issue of *Canadian Business*, was almost an appeal

- to the new Liberal government to reestablish order in its accounts, and to exert some control over its spending. (p. 143)
132. Campbell, Collin, "Political Leadership in Canada: Pierre Elliott Trudeau and the Ottawa Model" in Presidents and Prime Ministers (Washington: American Enterprise Institute Studies in Political and Social Processes, 1980), p.81. (p. 143)
133. Simeon, p.43. (p. 145)
134. Simeon, p.45. (p. 145)
135. Mutual Life of Canada, p.4. (p. 146)
136. Simeon, p.39. (p. 146)
137. Wilson and Hoffman, in their piece on Ontario, in Martin Robin's Canadian Provincial Politics (Scarborough: Prentice-Hall of Canada, 1972), go into an good analysis of the traditional relationship each of the provincial parties, but the Liberal party in particular, has enjoyed with their federal counterparts. (p. 147)
138. As quoted in Business Week (June 9, 1980). (p. 147)
139. Globe and Mail (January 1, 1981). (p. 148)
140. Globe and Mail (November 24, 1980) (p. 148)
141. As cited from the Globe and Mail (November 24, 1980). (p. 149)
142. Gwyn, p.285. (p. 149)
143. Pratt and Richards, in Prairie Capitalism: Power and Influence in the New West (Toronto: McClelland and Stewart, 1979), go into a detailed explanation of the western makeup, and the significance it plays in the issues of separatism, and western desire for autonomy. If nothing else, it lends an excellent history of the West's development, and how that history figures today. (p. 149)
144. Gwyn. p.277. (p. 149)
145. Gwyn's biography also covers the alienation of Pierre Trudeau towards the West, and his dislike for the West, while at the same time chronologically relating events and happenings in Ottawa with that developing western sentiment (Chapter 16, pp.274-291). On page 275, he recounts a meeting Trudeau had with western Liberals, where Trudeau made a faux pas, revealing that he did not even know he had not been out to visit the West for more than two years. (p. 149)
146. As quoted in Foster, p. 253. (p. 152)
147. Foster, p.253. (p. 153)
148. Simeon, p.40. (p. 153)

149. Richards and Pratt, p.165. (p. 154)
150. Richards and Pratt, p.166. (p. 154)
151. Gwyn, p.287. (p. 154)
152. Although somewhat dated, the information is still valid, and provides a useful insight into Lougheed's base of support. Long, J.A. and F.Q. Quo, "Alberta: One Party Dominance" in Canadian Provincial Politics (Scarborough: Prentice-Hall of Canada, 1972), p.23. (p. 155)
153. House, p.110. (p. 155)
154. House, p.112. (p. 156)
155. House, p.120. (p. 156)
156. Foster, p.257. (p. 157)
157. Foster, p.256. (p. 157)
158. Campbell, p.51. Campbell's article lists a wealth of references that deals with the subject of the centralization trend of Canadian federal politics. Several references of my own were crossed with those of Campbell's, such as Garth Stevenson, "Federalism and the political economy of the Canadian state" in The Canadian State (ed. L. Panitch), 1977, and Doern and Aucoin, Public Policy in Canada (Toronto:MacMillan Co. of Canada, 1979). The latter concentrates on the continued reliance on the part of successive Trudeau governments for more and specialized government agencies, the central role of the Cabinet, and Crown corporations. (p. 158)
159. Campbell, p.52. (p. 158)
160. Gwyn constantly mentions Margaret Trudeau's disgust for her husband's arrival at home with those "damn brown boxes" from the Hill, a physical example of laden he was with work and duties. Campbell goes into a page long description of some of Trudeau's responsibilities, p.55. (p. 159)
161. Gwyn, p.290. (p. 160)
162. Gwyn, p.277. (p. 161)
163. Gwyn, p.361. (p. 161)
164. Campbell, p.56. (p. 163)
165. Campbell, p.56. (p. 163)
166. Gwyn, p.154. (p. 165)
167. Walwyn, p.34. (p. 165)
168. In my interview with Turner, he stressed that he saw no similarities between the two projects. Syncrude, he noted, pri-

marily sought additional funds from the governments; the issue of contention for Alsands revolves around federal tax deductibility of provincial royalty payments, and guarantees for world prices. Alsands has not openly condemned the reference price of the NEP. (p. 166)

169. Ross Hennigar, President of Suncor Inc., as quoted in the Northern Miner (February 14, 1980). (p. 167)

170. Business Week (September 15, 1980), p.52. (p. 171)

171. Oil and Gas Journal (March 3, 1980), p.29. (p. 173)

172. Oil and Gas Journal (December 4, 1978), p.50. (p. 173)

173. Gwyn, p.377. (p. 177)

174. Gwyn, p.367. (p. 178)

175. One of Gwyn's concluding statements is that Trudeau "has never played fair." p.378. (p. 178)

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