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STUDY BY THE STAFF OF THE U.S.

General Accounting Office

Petro-Canada: The National Oil Company As a Tool Of Canadian Energy Policy

Canada utilizes its national oil company--Petro-Canada--to address important energy issues which are similar to those facing the United States. This study describes four principal functions which Petro-Canada has been assigned and how it performs them.

Information on the Canadian experience may help in evaluating U.S. energy policy approaches and possible options for attaining U.S. energy goals in the future. The study, however, makes no direct comparisons or assessments of the value of the Canadian versus the U.S. approach to similar energy problems, nor does it address directly the many issues which would have to be examined in considering the establishment of some form of national oil company in the United States.



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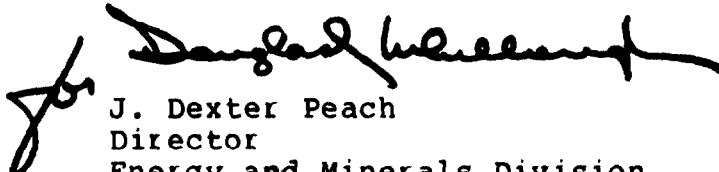
Like other consuming countries dependent on imported oil, the United States is vulnerable to potential disruptions in supply arising from technical problems, shifts in producing policies, political upheavals or disputes involving one or more producers. The awareness of this vulnerability has led some consumers to conclude that a commodity as critical to national security as oil should not be left completely in the hands of the private sector; that the government must assure that critical energy needs are met. One option to help achieve this goal which has been employed by many of the industrial consumers is government involvement through a national oil company. Since oil will continue to be a crucial part of U.S. energy supplies throughout the 1980s and since access to foreign oil will continue to be vital to national security, the appropriate role--if any--of the U.S. Government in ensuring secure supplies will inevitably arise. For this reason, we decided to examine the functions and responsibilities of an existing national oil company--Petro-Canada--to determine if any lessons can be derived that may be relevant to the U.S. energy situation.

This study is intended to be informational in nature and to demonstrate Canada's use of its national oil company in addressing critical energy issues which are similar to those facing the United States. The information derived from this study will hopefully be of use to U.S. policymakers in future deliberations on alternative options for best achieving U.S. energy goals.

Our analysis is based primarily on information obtained through our interviews with representatives of Petro-Canada, Canadian Federal Government officials from the Energy, Mines and Resources and Finance Ministeries and the Privy Council Office, and representatives of both Canadian oil companies and subsidiaries of U.S. oil companies operating in Canada. A preliminary draft of this study was sent to the President of Petro-Canada for verification of data and factual information, as well as to ensure that the company's viewpoint is accurately reflected.

Our analysis of Petro-Canada's activities indicates that a national oil company is capable of successfully accelerating the pace of exploration and development activities in high cost/high-risk areas where private company activity may be insufficient, and providing the government with general industry information and operating expertise to aid it in interpreting and evaluating information on oil industry trends and activities. It also appears that Petro-Canada operates as efficiently as the private sector, neither producing substantially less than private companies nor providing an increase in conventional oil and gas production beyond what private companies could have supplied. There is, however, insufficient evidence to date to determine whether Petro-Canada is a more or less effective oil importer than private companies or whether such government-to-government transactions will result in increased or diminished security of supply than private sector transactions.

This study is being provided to Committees and members of the Congress and others concerned with energy policy issues and options. In addition, copies will be made available to interested persons on request. Questions regarding this study may be directed to Donald Z. Forcier, Senior Group Director; William Kruvant; or Vincent Price on (202) 275-3563.


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D I G E S T

Similarities between American energy needs and the needs of industrial countries having national oil companies, along with the recurring interest in the proper U.S. Government role in oil activities, led the Energy and Minerals Division to examine the responsibilities and functions of an existing national oil company to determine what lessons--if any--might be learned and applied to the U.S. energy situation. Of the numerous government-owned companies, the Canadian national oil company--Petro-Canada--appeared to be the most logical candidate for examination because of the similarities in the energy and economic situations of the United States and Canada.

The purpose of this case study is informational, and is designed to shed light on how Canada uses a national company to address energy issues which are similar to those facing the United States. It does not directly address the many issues which would have to be examined in considering the establishment of some form of national oil company in the United States. In any event, such issues could not be properly addressed based on a single case study, and without further evaluation and contrast with the Canadian and other approaches to energy questions.

The study explains the four main functions which Petro-Canada has been assigned and analyzes how it performs these functions. They are (See pp. 18 to 25.)

--to act as a source of information on the oil industry, participating in various oil activities in order to provide Federal energy policymakers and regulators with reliable information and first-hand operating experience to regulate the industry more effectively,

--to act as a "social benefit" company by accelerating the development of high-risk

and high-cost energy resources which the private sector could not reasonably be expected to develop in large quantities,

--to act as a trading company, purchasing oil for Canada directly from foreign producer countries, and

--to produce more oil, both domestically and internationally.

Observations

GAO's work indicates that a national oil company such as Petro-Canada has performed and can perform some of the above functions better than others. In some instances it is too early to make any overall judgement.

Findings

--A national oil company cannot act as an effective "yardstick" for determining the true costs of exploring for and producing oil, and thereby serving as a measure against which the Canadian Government could judge private companies' performance. It can, however, act as an effective "window on the industry" to provide the Government with more general industry information, specific information for those projects in which it participates as a joint venture partner, and to supply the Government with operating expertise to help it interpret and evaluate information on industry trends and activities. (See pp. 26 to 30.)

--Petro-Canada's experience indicates that it is possible for a national oil company to fulfill a "social benefit" function by accelerating the pace of exploration and development activities in high-cost/high-risk areas where private company activity may be insufficient and currently uneconomic. (See pp. 47 to 54.)

--No evidence shows that the Petro-Canada experience has resulted in any net increase of conventional oil and gas for Canada. The resources produced by Petro-Canada probably would have been produced by the private sector. Neither is it likely that there has been substantially less production. The evidence indicates

that Petro-Canada is operating as efficiently as the private sector. Petro-Canada's primary reason for being involved in conventional production is to provide revenue to finance its nonconventional activities and to increase Canadian ownership in the oil industry. (See pp. 31 to 37.)

--It is too early to determine whether Petro-Canada is a more or less effective trader than private companies. It may have been successful in diversifying supply sources in at least one instance, but at terms which were probably about the same as those the private sector would have negotiated. It is also too early to determine whether this government-to-government transaction will result in supplies which are either more or less secure than private sector transactions. (See pp. 38 to 46.) GAO is examining this question further in a current study which is analyzing the changing structure of the international oil market.

In summary, the Petro-Canada experience indicates mixed results. In some cases it is either too early to determine or the evidence indicates that a national oil company is not particularly well suited to perform these functions. For others, notably the information function and the "social benefit" function, a national oil company may serve a useful purpose.

For both the information function and the "social benefit" function, the United States has chosen to pursue different means to achieve essentially the same objectives. The United States relies on information disclosure regulations and advisory groups such as the National Petroleum Council for information; it has chosen to promote the "social benefit" functions primarily by providing financial incentives to the industry through such mechanisms as the U.S. Synthetic Fuels Corporation. This study did not evaluate the comparative merits of the different approaches. Both would have to be viewed in the context of the economic systems and institutions of each country.

A preliminary draft of this study was provided to Petro-Canada officials for their comments. In their response, the officials stated that their reaction to the study is generally favorable

and they believe this to be a "well balanced and well thought out" study of Petro-Canada. These reviewers did, however, suggest minor corrections to certain factual information and offered clarifying language in some instances. Where deemed appropriate, Petro-Canada's suggestions have been incorporated into the study.

GAO is grateful to both the Canadian Government and Petro-Canada for their assistance.

C o n t e n t s

	<u>Page</u>
DIGEST	i
CHAPTER	
1 INTRODUCTION	1
Objective, scope, and methodology	1
2 PETRO-CANADA'S HISTORY	3
Why was Petro-Canada established?	3
Establishment of Petro-Canada	5
Petro-Canada's early operations and acquisitions	6
Petro-Canada under the Conservative Government	7
Petro-Canada under the current Federal Government	8
3 A COMPARISON OF CANADIAN AND U.S. ENERGY ENVIRONMENTS	10
Consumption	10
Production	12
Canada's current energy goals	15
The role of Petro-Canada in Canada's energy policy	16
4 PETRO-CANADA'S FUNCTIONS	18
The "window on the industry"	18
Petro-Canada as a production company	20
Petro-Canada as a "social benefit" company	22
Petro-Canada as an oil importing company	25
5 "THE WINDOW ON THE INDUSTRY"	26
Petro-Canada as a "window"	26
The "window" versus the "yardstick"	27
Can a national oil company act as a yardstick?	28
Observations	30
6 CONVENTIONAL OIL AND GAS PRODUCTION	31
Petro-Canada's performance in conventional production	31
The need for Petro-Canada in conventional production	34
Can a national oil company increase conventional production?	35
Petro-Canada: an efficient or inefficient producer?	36
Observations	37

7	AN IMPORTING ENTITY	38
	The Canadian Government's success in negotiating for oil imports	38
	The agreement's principal contri- bution	40
	Did direct Canadian Government negotiation ensure more secure supplies of oil?	43
	Insecurity of oil imports	44
	Do state-to-state agreements require a national oil company?	45
	Observations	45
8	"SOCIAL BENEFIT" ACTIVITIES	47
	Petro-Canada's financial contribution	47
	The need for Petro-Canada in non- conventional activities	50
	Petro-Canada as a catalyst in frontier exploration and development	51
	Petro-Canada's role in other non- conventional resource development	54
9	SUMMARY AND OBSERVATIONS	55
	Summary	55
	Observations	55

ABBREVIATIONS

Arcan	Atlantic Richfield Canada
cf/d	cubic feet per day
EMR	Energy, Mines and Resources - Canada
GNP	Gross National Product
LNG	liquefied natural gas
MBD	thousand barrels per day
MMBD	million barrels per day
NEB	National Energy Board
OECD	Organization for Economic Cooperation and Development
PEMEX	Petroleos Mexicanos

CHAPTER 1

INTRODUCTION

Since the Arab oil embargo of 1973, oil-consuming countries have realized that sufficient supplies of oil are crucial to the maintenance of their economic and political systems. The disruption of oil imports convinced many consuming countries, including the United States, of the need to increase domestic production and decrease import dependence, particularly on potentially insecure sources. This experience also led some countries to conclude that a commodity as critical to national security as oil should not be left completely in the hands of the private sector; that government must assure that critical energy needs are met. National oil companies are vehicles which many governments have used to become directly involved in oil supply. Japan, West Germany, Canada, France, the United Kingdom, Italy and Norway are among the many industrialized countries which have established such companies.

Objective, scope and methodology

The basic similarities between the energy needs of the United States and other industrial, oil importing countries has led to numerous proposals to create a U.S. national oil company. Since 1973, several bills have been introduced in the Congress, hearings held, and papers published on the question. Since oil will continue to be a crucial part of U.S. energy supplies throughout the 1980s and since access to foreign oil will continue to be vital to national security, proposals to involve the U.S. Government directly in producing or importing oil are likely to receive continued consideration. For these reasons, we decided to examine the functions and responsibilities of an existing national oil company to determine if any lessons can be learned that may be relevant to the U.S. energy situation.

The Canadian national oil company--Petro-Canada--appeared to be the most logical company to examine because the energy and economic situations of the U.S. and Canada are fairly similar. Furthermore, Petro-Canada is important to the Canadian energy scene, playing an integral role in the Canadian Government's energy policy. Since its creation in 1975, the company has made significant contributions, particularly in the area of nonconventional resource development.

The purpose of this case study is to shed some light on how Canada uses a national oil company to address energy issues which are similar to those facing the United States. We determined that the best method for analyzing this area was to examine the four major functions which the company has been assigned, how it performs these functions, and to make any observations which seem relevant to the U.S. energy situation.

The four principal functions assigned to Petro-Canada, which may also be of relevance to the United States are to

- act as a source of information on the oil industry, participating in various oil activities in order to provide Federal regulators with reliable information and first-hand operating experience so they may regulate the industry more effectively,
- produce more oil, both domestically and internationally,
- generate economic and social benefits through oil and related energy development (as a "social benefit" company), and
- purchase oil directly from foreign producer countries, negotiate with other countries for leasing and joint venture arrangements, and for energy technology cooperation.

This approach enabled us to analyze the company's policies and activities. Since these functions may also be important to U.S. energy policies, analyzing Petro-Canada's experiences may help the United States toward a better energy policy.

To perform this analysis, we interviewed representatives of Petro-Canada, the Canadian Government, and private United States and Canadian oil companies operating in Canada. We developed questions about the companies' operations, the relationship between the Government and the company, and questions to determine industry officials' perceptions of Petro-Canada and their relationship to it. The answers to these questions and the other documents and data provided were analyzed to determine the contribution, in economic and energy terms, of the company to the Canadian energy situation.

It should be noted that this report does not deal with the political implications and issues associated with a national oil company, either in Canada or the United States. We do not make any assessment as to the advisability or propriety of establishing any type of U.S. national oil company. Such determinations are beyond the scope of this study and cannot be made on the basis of a single case. However, the information provided by this study may be beneficial in evaluating U.S. energy policy approaches and the available options for attaining U.S. energy objectives.

CHAPTER 2

PETRO-CANADA'S HISTORY

Why was Petro-Canada established?

The Canadian Government's decision to create a national oil company must be seen in the context of the Canadian energy situation in the early 1970s.

Before 1973, western Canada produced more oil and gas than it consumed and exported about half of its production to the United States. On the other hand, the Eastern provinces relied on imports, primarily from Venezuela and the Middle East. The crisis of 1973-74 shocked the Canadian Government--as it did the governments of virtually all consuming countries--into the realization that dependence on imported oil placed the country in a vulnerable position. The Government recognized the need for secure supplies of oil and, in response, set the objective of greater reliance on domestic production. It also decided to reduce and eventually end oil exports.

Coincidentally, the oil industry drastically lowered its optimistic assessment of Canada's oil resources. This dramatic reversal by the oil companies--particularly at a time when concern for Canada's energy situation was so great--threw suspicion on both the quality and the objectivity of the information and forecasts supplied by the industry. Both the Canadian public and the Federal Government began to question the wisdom of relying predominantly on the private oil companies for such critical information.

Concern over Canada's energy situation rose further when the National Energy Board (NEB)--an advisory committee and regulatory body which reports to the Parliament through the Minister of Energy, Mines, and Resources--released a forecast indicating that Canadian oil production would soon begin to decline in the Western provinces unless important new discoveries were made. The NEB predicted possible oil and gas supply shortages as early as 1983.

Thus, by 1975 both Government and industry agreed that Canada would become increasingly dependent on foreign sources of energy and that the goal of self-sufficiency in oil would not be attainable in the near future. Domestic oil production had dropped from 2.1 million barrels per day (MMBD) in 1973 to 1.8 MMBD by late 1975. Over the same period, domestic demand increased from 1.71 to 1.75 MMBD. After a decrease in oil imports from a level of 1.0 MMBD in 1973 to .88 MMBD in 1974, they again increased to .89 MMBD in 1975. Consequently, the Canadian Government set the more realistic objective of self-reliance. Rather than attempt to provide sufficient domestic production to fully meet domestic demand--which at this point appeared impossible--Canada would acknowledge its reliance on imported oil but try to minimize its vulnerability. To accomplish this goal, the Canadian Government sought to increase

domestic production of conventional and nonconventional oil while searching for more secure sources of needed imports.

The dominant position of U.S.-owned subsidiaries in the Canadian oil industry became another concern of the Canadian Government during the early 1970s. Canada's reliance on foreign-owned companies both for information on its resources and most of its oil and gas production greatly disturbed the Government and the Canadian public. The perceived need for greater Canadian participation in the oil industry was growing.

These factors demonstrated to the Canadian Federal Government that the country's energy situation required a government presence in the oil and gas industry. The Government felt that it was essential to move beyond its traditional role of setting broad policy on the pace of development and the level of imports. The Canadian Government decided the time had come for direct participation in developing Canada's energy resources.

Petro-Canada was created to act as the Government's instrument for this direct participation. The Government sought to achieve five principal objectives through Petro-Canada. These objectives, as enumerated in the Petro-Canada Act of 1975, were

- to engage in exploration for and development of hydrocarbons and other types of fuel or energy,
- to engage in research and development projects relating to fuel and energy resources,
- to import, produce, transport, distribute, refine and market hydrocarbons of all descriptions,
- to produce, distribute, transport and market other fuels and energy, and
- to engage or invest in ventures or enterprises related to the exploration, production, importation, distribution, refining, and marketing of fuel, energy and related sources.

Although not specifically mentioned in the legislation, the debates prior to the creation of the company indicate that three additional objectives were on the Government's agenda

- to increase Canadian participation in the oil industry,
- to provide the government with more reliable information on Canada's resources, and on the oil industry and its activities, and
- to encourage and stimulate investment by private companies in certain areas through Government participation.

The most important goal was to increase domestic oil supplies, lessening the country's import dependence. The Government's view was that private companies were not exploring and developing oil aggressively enough, especially in the frontier areas such as the Arctic and eastern outer continental shelf. Not were private companies developing oil from Canada's reserves of tar sands as quickly as the Government thought desirable. Through Petro-Canada, the Government hoped to become directly involved in developing these resources and, through its financing and participation, stimulate private company investment by making these ventures more attractive.

The Canadian Government also hoped to use Petro-Canada to increase the security of oil imports. They expected that Petro-Canada, as a Government-owned company, would deal directly with producer governments and/or their national oil companies and thereby add an "official" character to importing agreements. This, it was hoped, would increase the security of imported oil supplies. Further, Petro-Canada's role as an importer was expected to lessen Canada's reliance on private companies--the majority of which were U.S.-owned--whose interests might be incompatible with Canada's during supply disruptions.

When Petro-Canada was established the Canadian oil industry consisted predominantly--roughly 95 percent--of subsidiaries of foreign oil companies. Partly out of fear of excessive dependence on supplies provided by non-Canadian companies, and partly out of a spirit of Canadian nationalism, the Government sought to increase the presence of Canadian-owned oil companies in the industry. Petro-Canada was to promote this goal by buying out foreign interests and by encouraging participation by Canadian companies in joint ventures with Petro-Canada.

As noted earlier, circumstances in the early 1970s had thrown suspicion on the information provided by private companies to the Government. It was intended that Petro-Canada be the Government's "window on the industry"--to provide it with a greater understanding of the oil industry's operations and activities. This "inside" knowledge and expertise was considered essential for the Government's formulation and implementation of energy policy.

In summary, the Canadian energy situation in the early 1970s demonstrated to the Federal Government a need for its direct active participation in the oil industry to alleviate current and potential problems. Petro-Canada was the instrument of this direct participation.

Establishment of Petro-Canada

Petro-Canada was created--after long and intense debate--as a Crown Corporation in 1975. The act established Petro-Canada as "an agent of Her Majesty" who owns all the shares of the corporation. These shares are held in trust for the Queen by the Minister of Energy, Mines and Resources (EMR). The act gives

Petro-Canada wide powers: "The Corporation may do such things as it deems expedient for or conducive to the furtherance of the objects of the Corporation, within and outside Canada..." In emphasizing the importance of Petro-Canada's role as an instrument of government policy, the act stipulated that "In the exercise of its powers, the Corporation shall comply with such policy directions as may from time to time be given to it in writing by the Governor in Council (i.e., by the Governor General, the Queen's executive representative in Canada, on the advise of the Cabinet)."

The Petro-Canada Act permitted the Federal Government to invest up to \$1.5 billion 1/ in the national company. The actual investment of these funds was to be made over a period of years and only in capital projects whose budgets have been approved by Government authorities. The initial authorized capital expenditure was \$500 million. In addition, the company could raise up to \$1 billion through Government-guaranteed debentures or other securities, loans from the Government, or sales of preferred shares to the Government. It was also authorized to borrow from private financial institutions.

From January 1976, when Petro-Canada began business, to the end of 1980, the Government invested \$580 million in common shares and \$423.8 million in preferred shares of the company, a total of roughly \$1.004 billion of the \$1.5 billion which the Government is authorized to invest. The Government's intention was that the total funds authorized by the act would carry the company through its first 5 to 7 years of activity, depending on the opportunities for worthwhile projects.

In addition to government funds, during this period Petro-Canada incurred outside debts totalling \$1.8 billion before repayment, consisting of preferred shares issued by its subsidiary, Petro-Canada Exploration, to Canadian banks (\$1.5 billion) and long-term debt (\$264 million) through income debentures to banks, mortgages, secured and unsecured notes and other noninterest-bearing debt.

Petro-Canada's early operations and acquisitions

At the time of its creation, the Federal Government transferred to Petro-Canada its 45 percent interest in Panarctic Oils, Ltd., its 15 percent interest in Syncrude Canada, Ltd., and its shares in the Polar Gas Project. Therefore, when Petro-Canada first began operations in January of 1976, it immediately became involved in Arctic exploration, tar sands development, and the examination of possible northern natural gas transmission systems.

Petro-Canada purchased Atlantic Richfield Canada (ARCAN) in August 1976 for \$342.4 million. The expressed purpose for this acquisition was to give Petro-Canada an exploration base and to provide it with additional expertise. Arcan's assets consisted mainly of oil and gas producing properties located in Western

1/All monetary amounts in this study are stated in Canadian dollars.

Canada, including 1000 oil and gas wells, five gas plants, twelve gas treating and compressing stations, and tar sands interests. In addition, it included interests in 10.6 million acres of undeveloped oil and gas properties in Alberta, British Columbia, the Northwest Territories, the Arctic Islands, and Hudson Bay. With this acquisition Petro-Canada became Canada's sixteenth largest producer of natural gas and its seventeenth largest producer of crude oil and natural gas liquids. The name of the company was changed to Petro-Canada Exploration, Inc.

In November 1978, Petro-Canada acquired controlling interest in Pacific Petroleum, Ltd., a Calgary-based oil and gas company which was 48.3 percent owned by Phillips Petroleum Company in the United States. In 1979, the remaining shares were acquired for a total price of \$1.5 billion. At that time, this was the largest merger ever made in Canada. Petro-Canada had now become the largest Canadian-owned oil company--with total assets of \$2.4 billion. The company was now an important oil and gas producer--second largest in natural gas and seventh largest in oil in Canada--and an integrated company with a small presence in refining and marketing. Among the interests acquired through the purchase of Pacific Petroleum were: a substantial number of producing oil and gas wells, prime land holdings in Alberta and British Columbia, extensive tar sands and heavy oil properties, some large coal leases, leadership in a \$1 billion heavy oil upgrading project, a 9-percent interest in Shell Canada, Ltd.'s Alsands tar sands project, a small refinery in British Columbia, 426 gas stations, 32 percent of West Coast Transmission Co. Ltd.'s British Columbian gas pipeline system, some limited international activities, and an interest in the Alaska Highway Pipeline.

Petro-Canada under the Conservative Government

The Progressive Conservative Party of Canada has long been opposed to a national oil company. Early in his term as leader of the Conservative Party, Joe Clark committed himself to dismantling Petro-Canada and selling it off to the private sector. The Conservative Party's arguments against the company were primarily three

- Government enterprises--including Petro-Canada--cannot be run as efficiently as private sector businesses,
- the Government does not need to own an oil company since it has adequate control over the industry, and
- the Government is in a conflict of interest by being both a regulator of and participant in the industry.

When the Conservative Government came to power in the May 1979 Federal elections, Prime Minister Clark immediately appointed a task force to advise the Government on how best to dismantle or "privatize" Petro-Canada. This task force concluded that "the public sector activities and assets of Petro-Canada should reside in a new Government agency." The task force stated that this agency should retain responsibility for

- negotiating State-to-State contracts for crude oil imports,
- promoting frontier exploration with increased Canadian participation and at a higher pace than would be expected of the private sector alone, and
- promoting tar sands and heavy oil research and development.

The Task Force further advised that "Petro-Canada, without its public mandate, should not be dismantled but should be privatized". In other words, the company's conventional oil activities would be transferred to a new private Petro-Canada. The recommended method for this procedure was to distribute the shares of the financially restructured and reorganized company to every citizen of Canada as a gift of the Crown.

In December 1979, Clark announced that the Government would retain a 30 percent interest in the national oil company and give away or sell the remaining shares. The Prime Minister said each Canadian would receive five free shares in Petro-Canada, accounting for 50 percent of the company, and the final 20 percent would be sold to either individuals or corporations. It was stipulated, however, that no individual or corporation would be allowed to hold more than 3 percent of the total shares, and sales would be limited to Canadians.

The Conservative Government's plans for Petro-Canada were never implemented. It was in power only 6 months and fell in December 1979. The air of uncertainty engendered by the Conservatives' threat of radical changes to Petro-Canada's structure and functions had a negative effect on the company's ability to function during that 6 month period. According to Petro-Canada's Chairman, Wilbert Hopper, this uncertainty contributed to low morale and a high rate of personnel turnover compared to the average for the industry, lowering the experience level in the company. It also adversely affected the company's long-term planning in certain areas. Hopper stated that, in some areas, ". . . we are proceeding. . . carefully until our current situation is cleared up so we can better plan just what resources we have. That is the natural outcome of the current controversy."^{1/} The uncertain situation also hindered Petro-Canada's negotiations over crude oil imports from Venezuela and Mexico.

Petro-Canada under the current Federal Government

The Liberal Party--which was instrumental in creating Petro-Canada in 1975--was returned to power in the February 1980 elections. Prior to his victory, Pierre Trudeau stated that his party would immediately have Petro-Canada reopen negotiations

^{1/}Testimony of Wilbert Hopper before the House of Commons, November 27, 1979.

to purchase oil from Venezuela and Mexico and inform other countries that Petro-Canada would be the instrument of Canada's oil business with them. Petro-Canada subsequently completed an agreement with Mexico for the importation of oil.

Federal Government officials have stated that they plan to expand Petro-Canada's role in the future, and they are determined to maintain and strengthen it as an instrument of public policy. Such expanded activities will include a role in further increasing Canadianization of the industry to meet the goal of 50 percent Canadian ownership by 1990, and a stepped-up role in government-to-government negotiations for oil imports. This latter function, Government officials feel, will become increasingly important in the future.

The Canadian National Energy Program, introduced October 28, 1980, clarifies the Federal Government's plans for Petro-Canada. To achieve increased Canadian ownership of the oil industry, Petro-Canada will acquire the Canadian operations of one or more of the multinational oil companies. In February 1981, in keeping with its expanded role in "Canadianization" of the oil industry under the new energy program, Petro-Canada made a bid to purchase Petrofina Canada, Inc. from its Belgium-based parent, Petrofina, SA for \$1.46 billion. At a later time, rather than overburden Petro-Canada, some of the assets acquired may be transferred to one or more additional Crown Corporations to be established by the Government.

As articulated in the new energy program, the Canadian Government intends for Petro-Canada to play an active role in Canada (or "frontier") lands. The legislation will permit Petro-Canada to act more vigorously as a catalyst and leader in project development. It gives the Federal Government the right to a 25 percent interest in every lease on Canada lands. This interest will be exercised by Petro-Canada--or some future Crown corporation--in the form of a carried interest. It will be convertible to a working interest at any time prior to the authorization of a production system for a specified field.

In addition, Petro-Canada will begin a new program to help developing countries exploit their energy resources. A new subsidiary of Petro-Canada--Petro-Canada International--will be created for this purpose. It will utilize the skills of private sector firms in Canada and form joint ventures with other Western state-owned companies.

The National Energy Program also proposed that Petro-Canada play a role in developing renewable energy resources. The Government intends to establish a Canadian alternative energy corporation--Canertech Inc.--as a subsidiary of Petro-Canada to support commercial production of renewable energy and conservation technologies. After the corporation has acquired some experience and can function independently, it will be separated from Petro-Canada and become an independent Crown Corporation.

CHAPTER 3

A COMPARISON OF CANADIAN AND U.S. ENERGY ENVIRONMENTS

Energy policies are a response to the formulating nation's situation; and similar national circumstances lead toward energy policies with much in common from country to country. There are similarities between the energy situations of the United States and Canada which lie primarily on the consumption side of the energy equation. Where they exist they have spawned either similar policies or the consideration of them. On the production side, however, each country's situation is quite different and policy paths have diverged considerably since 1973.

Consumption

Until recently, both the United States and Canada controlled the price of domestic crude oil. Both countries held crude prices below world levels, and by doing so kept average domestic refiner acquisition costs well below those in Western Europe. The United States, however, removed oil price controls in January, 1981. Both countries have also kept petroleum product taxes low relative to those imposed by other major industrial countries. As a result, Canadian and U.S. consumers have until recently enjoyed the lowest petroleum product prices in the industrialized world.

These low energy prices result in high energy consumption, and, in fact, Canadian and U.S. energy use per capita is about the highest in the world. In 1979, Canadians consumed the equivalent of 1.5 billion barrels of oil--2,200 gallons per capita--with the United States a close rival at about 2,100 gallons. This compares with an average of about 850 gallons in other major OECD (Organization for Economic Cooperation and Development) countries. Another obvious similarity is the large transportation network uniting both countries and stretching from the Atlantic to the Pacific.

Both Canada and the United States are about equally dependent on oil in their total energy budgets, but their net import dependence is quite different. In 1979, gross petroleum imports accounted for 45.6 percent of U.S. oil consumption, and net imports accounted for 43.1 percent. Comparable figures for 1980 were 39.9 and 36.8 percent, respectively. For Canada, gross imports were 35.9 percent of total petroleum consumption in 1979 and 34.3 percent in 1980. Net imports, however, were only 6.2 percent of consumption in 1979 and 9.8 percent in 1980 because nearly as much oil was exported from the western provinces to the United States as was imported to the country's East coast.

In recent years, proposals have been introduced in both countries to lower petroleum consumption by increasing the gasoline tax. Neither tax increase proved to be politically possible, and in the Canadian case probably was a major factor in the fall of the Conservative Government.

U.S. and Canadian energy policies which affect consumption have more recently begun to diverge. The United States has decontrolled oil prices. The Canadian National Energy Program, however, envisions continued price controls. Canada intends to maintain price controls on domestic production through

--agreements between the Federal Government and the oil producing provinces which hold Canadian conventional oil and gas sold in Canada to prices less than those which exist in world markets, and

--subsidizing oil imports to reduce per barrel costs to internal Canadian levels.

As a result of continuing controls, Canadian oil prices were about \$8.50 below the average cost of crude oil paid by U.S. refiners by the end of 1979. This differential widened considerably during 1980 and the first half of 1981.

Canada can insulate domestic consumers from high world oil prices because of its relatively low net import level. In 1980, Canada's net imports were only about 169 MBD, while the United States' were more than 6 MMBD. Many Canadian energy experts question whether such insulation can continue in the future. With conventional domestic production declining and international oil prices continually rising, Canada's Oil Import Compensation Program is becoming increasingly expensive. Between 1974, when the program was introduced, and 1979, the Federal Government paid oil equalization subsidies of over \$6 billion to refiners. Producing provinces and companies lost roughly \$13 billion each which they otherwise would have received if Canadian crude prices had not been controlled.

The 1980 National Energy Program stated that the Canadian Government is committed to a single price for crude oil in Canada and gradual increases in that price to encourage development of new supplies and conservation, while allowing consumers to adjust to increasing prices. Recognizing the consensus that oil prices in Canada should rise substantially but predictably, the Government prepared to establish a new "blended" system to combine the costs of different sources of crude into one weighted-average price. The program stated that the wellhead price of a barrel of conventional oil would increase one dollar every six months through 1983. From the beginning of 1984 through 1985, the price would rise \$2.25 every 6 months. Starting in 1986, the price would increase by \$3.50 every 6 months up to a level relative to a "reference price." A controversy over this pricing scheme was settled in September 1981, by an accord between the Federal Government and the Alberta Government. According to this agreement, the price of oil will rise by \$2.50 on October 1, 1981, by \$2.25 on January 1, 1982, and July 1, 1982. Thereafter, the price will rise by \$4 a barrel every six months over a 5-year period up to, but not exceeding, 75-percent of the world price level.

The blended price system will gradually combine the cost of imported oil into the price paid by Canadian consumers by means of an extension of the refinery levies system. When fully in effect, domestic refiners will pay a new Petroleum Compensation Charge which will pay importing refiners an amount which will reduce the average cost of imported oil to the average cost of all oil to Canadian refiners. This system will work much like the U.S. refiner entitlements system. At the beginning of 1981, the charge was \$4.75 per barrel, and will rise by \$2.50 a barrel at the beginning of 1982 and 1983. Through this process, the burden of imported oil prices will be shifted from the taxpayer to the consumer. Until this program is completely operational, however, the Canadian Government will continue to subsidize oil consumers out of general revenues.

Production

Canada and the United States have similar production experience in at least one respect: conventional oil production has begun to decline in both countries. Canadian production peaked in the early 1970s at about 2 MMBD. U.S. production likewise peaked in 1971 at about 11.4 MMBD.

Until recently, nonconventional production has been promoted much more heavily in Canada than in the United States. Until 1980, when the U.S. passed the Synthetic Fuels Act to spur the development of a wide range of nonconventional energy alternatives, the U.S. Government placed little emphasis on nonconventional hydrocarbons. In contrast, Canadians have been developing nonconventional resources since the mid-1970s, and have done so through direct government participation by Crown Corporations. Canada also has access to more nonconventional energy resources which can be developed with existing technology. For example, the Syncrude project in Northern Alberta uses steam and caustics to produce synthetic crude oil from the abundant Athabasca Tar Sands. Other than scale problems, it appears to have progressed with few technological or environmental impediments. The same cannot be said for U.S. oil shale initiatives. Despite 20 years of research, no fully acceptable technology for extraction has yet been developed, and environmental constraints are still seen by many as severe.

Canadian and U.S. energy resource bases also differ in that Canada appears to have more frontier Arctic potential as well as abundant hydro-power and natural gas which are clean substitutes for petroleum in electricity generation. Both are in limited supply in the United States.

While Canada is relatively well endowed with energy resources in relation to its domestic requirements, it is not particularly well endowed with the financial resources required to develop them. Canada's Gross Domestic Product is about one tenth that of the United States, and developing its energy resources requires larger amounts of investment capital than can be generated internally. In the past, Canada has looked to U.S. capital markets--and U.S.

companies--to fill this gap. As a result, the development of Canada's industrial base, and in particular its energy sector, was fueled by direct U.S. investment.

According to 1979 figures, foreigners control 35 percent of Canada's nonfinancial industry, 56 percent of its manufacturing, and over 70 percent of its oil resources. Since World War II, the United States has provided over 80 percent of Canada's foreign capital. In fact, over 24 percent of all U.S. direct investment abroad is in Canada, largely in the petroleum sector.

Direct foreign participation and ownership of Canadian energy resources has shaped Canadian attitudes toward their energy industry. While the issue of foreign ownership rarely arises in the United States, Canadians are highly sensitive to what they consider foreign, particularly U.S., financial domination of the Canadian energy industry. This attitude appears to be an expression of nationalism and concern that foreign ownership can result in large transfers of wealth to parent companies outside of Canada. Whether energy development in Canada would have proceeded very differently if the developers had been solely Canadian is unclear. However, this attitude toward investment in Canada's energy resources has spawned a number of government measures, both provincial and Federal, designed to limit future energy participation by U.S. companies, and to "roll back" foreign equity participation to 50 percent Canadian ownership. Consequently, the fact of ownership, as opposed to control over resources, is a potent factor in the Canadian energy environment and one which colors Canadian energy policy. Since this factor plays virtually no role in the United States, it is a particularly important difference between the energy situations in the two countries.

In the 1960s, developing a barrel of North American oil and gas reserves typically cost about \$500-\$1,000 per barrel of daily production capacity (\$2,000-4,000 per barrel at mid-1980 levels). However, as conventional sources have dried up, oil development costs have increased considerably. An average North Sea find required \$8,000-\$10,000 per daily barrel. Prudhoe Bay production is also in this range, and including transportation via pipeline to Valdez, the cost is closer to \$15,000. Tar sands production already runs over \$40,000 per daily barrel of capacity, and expenses involved in the Beaufort Sea and high Arctic production will undoubtedly be even greater.

This sort of development outlay has a profound impact on the cost of energy. For example, in a paper presented to a recent conference on "Fuels and Financing in the 1980s," Joel Bell of Petro-Canada stated:

"The carrying and amortizing of an investment cost of say \$10,000 per daily barrel, assuming a relatively comfortable amortization period of about 7 years, requires some \$6 per barrel. At \$30,000-\$40,000 per daily barrel, a 7 year amortization period becomes quite onerous--\$16-22 a barrel--and it is anyone's

guess as to what interest rates might be in the future for such projects. These numbers are the financing costs alone, and do not yet account for operating costs and some value for the hydrocarbons which must also be met out of the market place."

Were Canadians to bear all financing costs themselves, the burden would be enormous. In 1979, Canadian energy investment accounted for over 4.5 percent of the GNP, and 32 percent of total business fixed investment. The Royal Bank of Canada has estimated that energy investment as a percent of GNP will double in the next decade, and by the 1990s will account for 47 percent of total business fixed investment. Without foreign participation, these figures suggest a tremendous concentration of Canadian financial resources in the energy sector, to the detriment of other sectors with competing capital requirements. Yet without the assurance of equal treatment as well as the possibility of controlling equity interest, many foreign capital sources may be untappable for Canadian energy development. It appears that there is at least a potential conflict between the Canadian Government's policy to reach 50 percent Canadian ownership of the industry by 1990--which will discourage foreign investment in Canada--and the country's capital requirements for increasing oil production.

Another important difference between the energy situations of Canada and the United States is the power of the Federal Government over energy exploration, development, and distribution. In the United States, the Federal Government has substantial control over each of these areas, primarily through regulation and taxation of energy market participants. This stems from U.S. constitutional principles which reserve the taxing power to the central government along with regulating products in interstate commerce. This Federal authority has been used to impose interstate energy price levels, and generally harmonize or alter many State laws which affect energy development. Moreover, development and exploration on Federal lands is almost solely the responsibility of the Federal Government, as is the promulgation of rules and regulations affecting energy activity on the U.S. continental shelf, America's energy frontier.

In Canada, frontier development in federal territories such as the Beaufort Sea and the high Arctic is also largely under federal control. However, the British North America Act of 1867--the Canadian Constitution--gives fewer rights to the central Government than does the American. The act reserved powers such as national defense, international trade and commerce, banking and currency, criminal law, postal services, certain taxes and all powers not expressly granted to the Provinces for the Federal Government. Provinces, however, have broad authority to administer and legislate on such matters as health care, education, and, in particular, property rights. Lacking jurisdiction over inter-provincial commerce, the Canadian Government cannot unilaterally impose a national energy development, exploration or distribution policy. It can only negotiate one with the Provinces, using as leverage its control over international commerce and its role as

the director of the country's frontier development. Thus, domestic oil prices are held well below world levels not by federal law, as in the United States, but by an agreement between producing provinces and the Canadian Government in which both are essentially equal partners.

The Canadian central/regional power mix creates a vastly different political environment for national energy policy formulation from that prevailing in the United States. Consequently, energy policy actions which may be pragmatic and efficient for Canada may be less so within the U.S. political structure. This fact must be kept in mind when evaluating Canadian energy policies as potential paradigms for the United States. For example, Canadian policies designed to encourage frontier exploration and development, as well as recent national initiatives to diversify sources of crude oil supply and product imports, can be readily evaluated from the standpoint of U.S. energy policy objectives, since both Federal Governments have similar powers and responsibilities in the international and frontier areas. Canadian policies designed to achieve "self-sufficiency," equitable internal pricing, or greater domestic ownership of resources, should be analyzed with caution because of the substantially different Canadian energy environment.

Canada's current energy goals

The energy goals of the Liberal Government of Prime Minister Trudeau are not significantly different from those which led to the creation of Petro-Canada in 1975. While the goals have remained essentially the same, the strategies for achieving them have changed.

Canada faces the same basic energy problems in 1980 as it did in 1975. Canada is the largest per capita energy user in the world because of climate, geography, and relatively low prices. It still relies on potentially insecure sources of imported oil for some of its consumption because of insufficient domestic production. In addition, the Canadian oil industry is still dominated by U.S.-owned companies, although the degree of dominance is declining.

In response to this energy situation, the Canadian Government formulated a new National Energy Program. The three principles governing this program, as enumerated in the plan, are

- security of supply and ultimate independence from the world oil market;
- opportunity for all Canadians to participate in the energy industry, particularly oil and gas, and to share in the benefits; and
- fairness, with a pricing and revenue-sharing regime which recognizes the needs and rights of all Canadians.

The specific elements of the Program employ pricing regimes, fiscal measures, expenditure programs, and direct federal action to

- balance domestic oil supplies with domestic demand by 1990 through decreased reliance on imports and increased conventional and nonconventional production;
- achieve an equitable sharing of energy benefits and burdens among Canadians;
- lead to a high level of Canadian ownership and control of the energy sector (up to 50 percent by 1990);
- expand the role of the public sector in oil and gas; and
- ensure greater industrial benefits from energy development.

The role of Petro-Canada in Canada's energy policy

Among the measures which the Canadian Government expects to use to further the goals stated in the National Energy Program is an expanded role for Petro-Canada. The company will help increase Canadian ownership of the industry by acquiring the subsidiaries of some multinational oil companies. It will also expand its role as a catalyst and leader in frontier project development. The plan envisions continuing Petro-Canada's activities in bilateral oil purchase agreements. In addition, the Government company will expand its activities into aiding developing countries to develop their resources and provide support for renewable energy and conservation technology through two subsidiaries, Petro-Canada International and Canertech Inc.

Petro-Canada's important position in Canada's energy situation derives from the Federal Government's belief that it should play a direct, active role in energy development. The Canadian Federal Government has four broad types of policy instruments at its disposal to implement its energy strategy. These are: regulatory control, oil and gas pricing policies, fiscal measures, and direct investment. The Government has traditionally used regulatory control and fiscal measures with varying success, and this led the Federal Government to conclude that the traditional measures alone were insufficient to achieve Canada's energy goals. The Government determined that there was a need for direct participation in energy ventures and Petro-Canada is the vehicle for doing so. The company takes responsibility for the Government's investments in the energy industry and is the agency for making these investments.

To say that the Government formulates energy policy and then instructs Petro-Canada to implement this policy is an over-simplification. In reality, the interplay between Petro-Canada and the Government in the formulation and implementation of policy is more cooperative in nature. Petro-Canada is not only an

instrument of energy policy but it also participates to a certain degree in policy formulation.

As an instrument of policy implementation, Petro-Canada operates under the control and direction of the Federal Government. The Government's control stems partly from its authority over the company's budget; Petro-Canada must submit an annual capital budget to the Minister of Energy, Mines, and Resources for approval by the Governor in Council. Government control is further ensured because the Board of Directors of Petro-Canada is appointed by the Governor in Council, and includes the Deputy Minister of Energy, Mines and Resources and representatives of other Government ministries.

In addition to general control over the company's operations, the Government has the authority to direct Petro-Canada to undertake specific projects that it deems crucial to energy policy goals. This is stated clearly in the Petro-Canada Act of 1975: "In the exercise of its powers, the Corporation shall comply with such policy directions as may from time to time be given to it in writing by the Governor in Council." This is the legal basis of Petro-Canada's role as an instrument of Canadian energy policy.

Petro-Canada also plays an important policy role by educating the Government on conditions in the industry and on technical matters relating to oil and gas production where the Government has little expertise. Petro-Canada aids the Government in forming national energy policy by

- providing more accurate and timely information about the extent of Canada's conventional and nonconventional oil and gas supplies and the costs of developing them, and

- ensuring that Petro-Canada's experience as an operator in diverse phases of the industry is communicated to the Government to improve the information base of policymaking.

In its advisory role, the company provides the Government with information and advice which the Government can then use in making decisions with a better understanding of their potential effects both on the oil industry and the overall Canadian energy situation.

CHAPTER 4

PETRO-CANADA'S FUNCTIONS

Petro-Canada has four principal functions. These may be characterized as

- to act as a "window on the industry,"
- --to produce oil and gas,
- to capture social or economic benefits for the Canadian people, and
- to import oil.

Each function supports the formulation and implementation of Canada's energy policy, and consequently, furthers the country's energy goals.

The "window on the industry"

One of the functions Petro-Canada performs is to act as the Government's "window on the industry." Essentially, this means that Petro-Canada participates in diverse activities in the oil industry, and, as an "insider," acts as an advisor to the Government. Through this wide ranging participation in the industry, the national company acquires considerable experience and technical expertise, as well as some knowledge of the general activities of private oil companies. The Government then relies on Petro-Canada to educate it on these matters.

When the debate over a national oil company began, the Department of Energy, Mines, and Resources (EMR) defended its position in favor of such a company on several grounds. One of these was the idea that a national oil company could be used as a "yardstick." The distinction between the "yardstick" function as originally envisioned for Petro-Canada and the "window on the industry" function which it now performs is often blurred and, therefore, requires clarification.

The "yardstick" function, as described by the EMR in "An Energy Policy for Canada - Phase I" in 1973, means that Petro-Canada would advise the Government on guidelines for determining the true costs of exploring for and producing oil. Information provided by the company would serve as a measure against which the Canadian Government could judge private companies' performance. This would require the company to extend its range of interests and operations to all industry activities so the Government could determine the actual costs of oil and gas production.

One reason for promoting this concept was that the Government felt it did not have sufficient information on individual companies and such information could only be obtained by direct Government participation in the industry. Another factor inherent

in the concept was a general suspicion of the private companies and the assumption that they were hiding important information from the Government.

Petro-Canada has never actually been used as a "yardstick" and, in fact, it appears that the original rationale for using it as such has disappeared. The Canadian Government passed disclosure legislation several years ago and now has ample information on individual companies. For example, all companies operating in Canada must provide the Federal Government with information on taxes, finances, cash flow, source and disposition of funds, production capacities and types, royalty calculations for foreign governments, production, movement of crude, product disposition, exports, reports on future plans, forecasting, research, etc. Many in both Government and industry believe that the Canadian Government now has all the individual company information that it could possibly need. Therefore, the need for Petro-Canada to generate "yardstick" information no longer exists.

Not only is a "yardstick" not needed to generate this information now, but it also appears that Petro-Canada would not have been effective in such a capacity. Because Petro-Canada receives some preferential treatment from the Government (i.e., the "back-in" rights, Government funding and other features discussed later), it would not give a true picture of the costs and problems involved in private oil and gas exploration and production operations. These government preferences distort, and therefore make invalid, comparisons with private oil companies. In addition, any valid comparison is distorted because of the differences in the factors motivating the two types of companies. Private companies are "bottom-line" operations, concerned with and motivated by the desire to receive the greatest return on their investments in the shortest period of time. Profits are their principal goal. On the other hand, Petro-Canada, as an instrument of Government policy, is primarily motivated to help achieve national goals. While still concerned with the "bottom-line," short-term profits are secondary to national goals in determining Petro-Canada's investment decisions. Consequently, the national company invests in projects that are essential for national energy goals but which have a long lead-time and may not give a return in a financial sense for many years. These are projects (such as tar sands and Arctic exploration) which, because they are not currently economical, have not drawn sufficient investment by private companies. Therefore, comparing Petro-Canada's operations which are often presently noncommercial with private companies' which are currently profitable would not provide any valid "yardstick" information to the Government.

Petro-Canada, however, does act as a governmental "window" on the industry. The Government frequently seeks the company's viewpoint because of its practical experience and its technical expertise, and because Petro-Canada is more forthcoming and cooperative than are many private firms. Petro-Canada has access to technical information, the ability to assess and interpret this

information, and the ability to educate policymakers who normally would have little understanding of technical matters and their implications. The importance of this function in the decision-making process is evident.

Petro-Canada as a production company

In addition to its other, more exotic roles, Petro-Canada is a conventional oil and gas exploration and production company. Its conventional oil and gas activities are centered primarily in Western Canada. As noted earlier, these operations were first acquired through the purchase of Atlantic Richfield Canada and Pacific Petroleums, and more recently, the purchase of Petrofina Canada will add to these operations.

In 1979, Petro-Canada ranked second in Canadian gas production at a production rate of 410 million cubic feet per day. In 1980, production declined somewhat due to lower exports to the United States. The 1979 production equalled about 5 percent of Canada's natural gas production. Approximately half of Petro-Canada's gas production is located in British Columbia. The company is also a major producer in the shallow gas areas of the northwest and southeast portions of Alberta, and has other operations throughout that province. Petro-Canada has estimated that its gas reserves at the end of 1980 were 4,039 billion cubic feet, equal to about 7 percent of total Canadian gas reserves.

Petro-Canada ranked roughly eighth in oil and natural gas liquids production at a rate of 62.5 MBD in 1980. This was equivalent to about 4.4 percent of Canada's total oil and natural gas liquids production. About 90 percent of Petro-Canada's oil production comes from Alberta. At the end of 1980, Petro-Canada estimated its reserves of oil and natural gas liquids at 306.8 million barrels, or roughly 4 percent of the total reserves in Canada. The company produced 22.7 million barrels of oil and gas liquids in 1980. Oil and natural gas liquids production were reduced 11 percent because of a reduction of markets for heavy oil and some prorating of light and medium crude production, according to Petro-Canada officials.

Petro-Canada undertook extensive development drilling in 1979. The company drilled 235 gross (103 net) development and production wells at a cost of \$32 million. ^{1/} Of this total, 222 gross wells (96 net) were successful oil or gas producers. In 1980, drilling increased about 21 percent.

Another part of its oil producing activity is Petro-Canada's 12 percent interest in Syncrude, Ltd., which is producing synthetic crude oil from the Athabasca tar sands in Alberta. In 1980,

^{1/}Gross wells drilled is the total number of wells in which Petro-Canada had financial interests; net wells constitute the company's accumulated total interest in the wells drilled.

the Syncrude project produced 29.6 million barrels of crude oil, averaging 81 MBD. In 1980, Petro-Canada's share of production from the Syncrude plant amounted to an average of 9.7 MBD. Petro-Canada expects to expand synthetic crude oil production considerably in the future. The company's role in developing such nonconventional sources of oil is discussed in chapter 8; it is mentioned here as one aspect of Petro-Canada's contribution as a production company.

During 1979, Petro-Canada was actively involved in exploration. In Western Canada, it drilled or participated in 153 exploratory wells and acquired 148,000 hectares (370,000 acres) of land for exploratory purposes for \$115.9 million. This cost was incurred primarily in the central Alberta and northeastern British Columbia gas areas, the West Pembina area, and in the Lloydminster area of Alberta and Saskatchewan.

Petro-Canada has also undertaken extensive exploration activities in Canada's frontier areas such as offshore East Canada, the Arctic, and the Northwest Territories. This has been one of the company's primary objectives since its creation. It participated in 60 of the 114 frontier wells drilled by the end of 1979. From 1976 through 1979, Petro-Canada spent \$246.6 million or 60 percent of its exploration budget on frontier exploration. This is approximately 12 percent of the industry total. The company's frontier exploration expenditures for 1979 alone were \$64 million.

Off the East Coast area of Canada in 1979, five discoveries were made on outer continental shelf lands in which Petro-Canada has a working interest varying from 10 to 45 percent. The major frontier exploration successes of 1980 were the two encouraging delineation wells drilled in the Hibernia field and the possible discovery of a second oil field at Ben Nevis within the same sedimentary basin as Hibernia. In the Arctic and Northwest Territories, the company's activities consist of investment in Panarctic Oils, Ltd. and its support of the Arctic Islands Exploration Group. In 1979, the group made the most significant Arctic gas discovery in 5 years in the Whitefish well.

None of Petro-Canada's ventures in the frontier areas are presently producing. Further exploration and development of those areas is a high priority for Petro-Canada since it is a high Federal Government priority. Again, the company's frontier exploration activities are mentioned here merely to demonstrate Petro-Canada's activities as a production company; Petro-Canada's primary role in frontier development is discussed in detail in the following section.

Petro-Canada has a limited presence in foreign exploration. The company acquired some international interests with its purchase of Pacific Petroleum. In 1979, Petro-Canada acquired a 5-percent interest in an exploration block in the Norwegian North Sea. In 1980, a substantial new oil discovery was made in this block. The company has also been involved in seven of the eight major seismic programs being conducted in offshore China. It holds varying

interests in eight permits in offshore Spain, in blocks in the Gulf of Mexico, and in the United Kingdom, German and Italian offshore areas.

Petro-Canada as a "social benefit" company

Petro-Canada's principal function is to implement policies that generate benefits for the public through energy development. These activities may not always be profitable for the company but are in the national interest. This function is inherent in the concept of a national oil company; a publicly owned oil company should operate for the benefit of the public.

Petro-Canada performs its "social benefit" function by investing in the research and development of nonconventional energy resources. Such resources include synthetic crude oil and tar sands, heavy oil, and oil and gas from frontier areas (the Arctic, East Coast, and Northwest Territories). These areas involve high costs and high risks, and consequently are often unattractive to private oil companies. Under these circumstances, the tendency of private firms is to avoid these high-cost/high-risk areas of investment until such time as they become profitable.

In the area of nonconventional high-cost/high-risk resources, Petro-Canada sees itself as a catalyst that will accelerate development of these resources by stimulating investment by private companies. The process is relatively simple. Petro-Canada either undertakes on its own or is directed by the Government to undertake a specific venture which is deemed important to the national energy interest but is not currently being developed at a sufficiently rapid pace. Depending on the circumstances, the company may form a consortium with private companies to undertake a new project, or buy into an already initiated project. In some cases, Petro-Canada has a special privilege to "back-in" to certain underdeveloped ventures. 1/

1/The "back-in" provision is a special privilege granted to Petro-Canada by Sec. 120 of the Canada Oil and Gas Land Regulations:

"Where an application is made for a special renewal permit ...for any Canada lands in respect of which no declaration of a significant discovery is in force, Petro-Canada shall, on giving notice that it exercises its rights under this section, have the right to be granted--where the Canadian participation rate of the applicant for the special renewal permit is twenty-five percent or more but not more than thirty-five percent, a ten percent interest in the special renewal permit to be granted to the applicant; or--where the Canadian participation rate of the applicant for the special renewal permit is less than twenty-five percent, a ten percent interest in the permit plus an additional interest therein, not exceeding fifteen percent, of one percent for every one percent that the Canadian participation rate falls below twenty-five percent."

By the end of 1979, Petro-Canada had spent over \$246 million, approximately 60 percent of total exploration expenditures, on frontier exploration. This was about 12 percent of the industry total. Through this investment, the company participated in 60 of 114 frontier wells drilled from 1976 to 1979. Petro-Canada has become a major landholder and participant in all frontier areas. According to Petro-Canada officials, "with the exception of the Beaufort Sea we can reasonably claim to be the prime mover in frontier exploration."

Frontier areas where Petro-Canada acts as a catalyst include the Arctic Islands and the East Coast of Canada. In the Arctic, Petro-Canada works through Panarctic Oils Limited and its support of the Arctic Island Exploration Group. Panarctic is an industry/Government consortium, owned 50 percent by the Canadian Government through Petro-Canada and 50 percent by 29 other largely Canadian companies. The Arctic Islands Exploration Group is also a consortium owned 22 percent by Panarctic, 18 percent directly by Petro-Canada, 35 percent by Esso Resources Canada Ltd., and 25 percent by Gulf Resources Canada Ltd.

Petro-Canada's participation in the development of synthetic crude oil from tar sands is one of its most significant contributions in the area of nonconventional resource development and thereby in fulfilling its social benefit function. As noted earlier, Petro-Canada inherited a 15-percent interest in the Syncrude Project from the Canadian Government when it was first established. In 1979, the Alberta Energy Company acquired 20 percent of Syncrude, reducing Petro-Canada's interest in the project to 12 percent.

During 1980, the Syncrude facility operating in the Athabasca Tar Sands deposit in Northern Alberta produced 29.6 million barrels of synthetic crude oil. Production for the plant averaged 81 MBD in 1980. It is expected that by 1983, maximum production will be 129 MBD.

Petro-Canada also has a 9-percent interest in the Alsands project, acquired with the purchase of Pacific Petroleum. This is a proposed \$6.7 billion, 139 MBD tar sands mining plant planned for an area north of Fort McMurray, Alberta. The plant is scheduled to start up in 1987.

In 1980, Petro-Canada, in partnership with Nova, an Alberta Corporation, initiated what will be an additional tar sands mining project. It will be called Canstar and will be the first Canadian controlled and developed tar sands facility. The start-up date for the project is scheduled for 1990.

In addition to these tar sands mining projects, Petro-Canada has been involved in two major in-situ pilot projects which may provide a means of exploiting tar sands resources that cannot be recovered by mining techniques. The company is operator of the PCEJ project, a pilot project which will test an electric-preheat

steam drive in-situ process. Petro-Canada is also operator of a five company project to test a thermal mining technique in the Alberta tar sands. The company began the first phase of the operation in 1979 which involves tunneling into the limestone lying under the tar sands zone and drilling up into the formation.

Petro-Canada has been involved in two smaller in-situ tar sands projects. A project at Gregoire Lake is testing a three phase extraction process which involves preheating the tar sands formation, reducing the formation's pressure, and then using forward combustion and water flooding to force the oil to the surface. At Golden Lake, Petro-Canada is investigating carbonated rock formations containing bitumen deposits.

The company is also involved in developing Canada's vast heavy oil deposits. Canada has enormous heavy oil resources in Alberta and Saskatchewan which have not yet been produced at significant recovery rates and economic production costs. In late 1978, Petro-Canada along with Gulf Oil Canada and Saskoil committed themselves to a \$99 million program to acquire leases in Saskatchewan, and in 1980 began preliminary work on two thermal pilot projects in the Cactus Lake field. In the Primrose area of Alberta, Petro-Canada drilled 78 wells of a 100-well commitment by the end of 1980. A steam stimulation test was completed on one well and the company initiated the construction of an enhanced oil recovery project to determine the long-term production capacity of these resources.

Petro-Canada is also operator and has a 50-percent interest in a \$5.9 million seven well heavy oil pilot project at Muriel Lake. The pilot project is designed to evaluate steam stimulation as a recovery mechanism. In addition, the company is a 50-percent partner in and operator of a pilot project at Kinsella in Alberta to test steam flood and fire flood processes.

Also in the heavy oils area, Petro-Canada has begun a major research program with Petroleos de Venezuela, the Venezuelan national oil company, to exchange information and undertake research and development activities to determine ways of extracting and upgrading heavy oil resources in both Canada and Venezuela.

To develop other nonconventional, high-cost and/or high-risk resources, Petro-Canada is also the Project Manager for the Arctic Pilot Project. The purpose of this project is to demonstrate the feasibility of producing and delivering 7 million cubic meters per day of liquified natural gas from Melville Island in the Canadian Arctic to southern markets. The total cost estimate for the project is \$1.75 billion with a planned start-up in 1985. It is expected that this project will provide significant economic benefits to the Arctic and Eastern Canada, reduce Eastern Canada's dependence on imported oil, and open up the Arctic to year-round shipping.

By its participation in all of these activities--activities which for the most part are not considered currently profitable by private companies--Petro-Canada takes a direct step towards development of nonconventional sources of energy supply. Also through its participation, Petro-Canada lowers the costs and risks to private companies, and thereby encourages these other companies to invest in these operations. This has a significant effect on the pace of the development of these resources and it appears evident that, because of Petro-Canada's presence, these resources will be available sooner than they would otherwise.

Petro-Canada as an oil importing company

Another of the functions envisioned for Petro-Canada when it was established--and a role which the Federal Government vows to increase in the future--is to import oil directly from producer countries. As noted earlier, the purpose of assigning this responsibility to Petro-Canada was to secure more reliable sources of imported oil. The Government's reasoning was that the producer governments would be less likely to renege on deals with a Canadian national oil company than they would with private companies, and that Canada could exercise more control over its supplies if they were handled by a Government-owned company rather than a private company.

The Canadian Government was also interested in government-to-government agreements on oil because, according to Petro-Canada officials, this is a growing trend in international oil transactions and many of the producing countries are becoming more interested in such agreements.

The only concrete example of how Petro-Canada functions as an oil importing company is its role in the agreement between Canada and Mexico for the purchase of oil negotiated in 1979. This agreement was a portion of a larger protocol between the two countries, concerning not only trade in oil but in other commodities such as steel, coal, and uranium. The initial negotiations were directly between representatives of the two Governments. Originally, an agreement was reached whereby Mexico would supply Canada with 100,000 barrels of crude oil per day at the standard Mexican price. It is significant, however, that the Mexican Government later told Canada it would sell only half that amount. After the agreement was reached between the two Governments, the specific details of the actual sale were negotiated between the national oil companies, Petro-Canada and Petroleos Mexicanos (PEMEX).

"THE WINDOW ON THE INDUSTRY"

Petro-Canada as a "window"

Petro-Canada provides the Government supplementary information, expertise, and advice on oil industry activities. Both Petro-Canada and Federal Government officials believe that the company has been successful in this respect. Government representatives generally believe that Petro-Canada provides them with information which they could not easily obtain otherwise, and that this is crucial to the formulation of effective energy policy.

The information supplied by Petro-Canada can be divided into two principal categories: general industry trends and developments in oil and gas operations, and specific information on projects in which Petro-Canada participates with private firms. Information falling within the first category includes Petro-Canada's views--from its perspective as a large oil and gas firm operating alongside numerous private firms in the Canadian energy industry--on developments in the Canadian oil industry, new discoveries by other firms, prospects for exploration successes, trends in the world energy situation, new technology advancements, etc. A Petro-Canada representative stated that the Government often contacts company officials to get their managerial perspective on oil matters. A specific example of such information sought from Petro-Canada was a request from the Government for Petro-Canada's supply and reserve forecasts to compare with those compiled by the Government. One EMR official stated that one of the recent occasions on which Petro-Canada provided general information involved the introduction of the 1980 National Energy Program. According to this official, Petro-Canada aided the Government by providing a "fuller and faster feedback" than private companies as to how the energy program was likely to affect them as a large Canadian oil company, and how Petro-Canada viewed the program's effects on the industry as a whole. As of the beginning of the year, to the best of this official's knowledge, no private company had come forth with any such feedback to the Government.

Project-specific information includes details on particular costs incurred in a project and data on operations and activities rather than on specific companies' policies. A specific example provided by an EMR official illustrating the type of project specific information supplied by Petro-Canada is the Hibernia oil discovery. The Canadian Government was able to get a better insight into the activities and costs involved in this discovery through Petro-Canada because it is an "insider," actually participating in the project. Petro-Canada, according to the EMR official, was more open and forthcoming with information about the discovery than were the private companies involved in the same project.

Petro-Canada is sometimes in an awkward position because it is both a representative of the Government and a participant with private firms in various projects. Thus, the company is placed in a potential conflict of interest. Understandably, beyond the information required by the Government from private companies, there is some information which companies would prefer that the Government not know. This information would include such sensitive matters as strategies or policies for confronting the Government on pricing, leasing, and other issues. However, when a company is a partner with Petro-Canada, representatives of the Government--in the form of Petro-Canada's Board Members--are actually taking part in planning these ventures. Recognizing the problems inherent in this relationship, Petro-Canada representatives excused themselves from a Syncrude board meeting in one instance when relations with the Government came up for discussion. Such situations may hinder the company's effectiveness as both a full partner in joint ventures and a source of information for the Government.

Petro-Canada is effective in its current role as a "window" on the industry in that it informs and educates the Government on oil industry matters. It does not provide a steady stream of data, but is an occasional informal source of information to the Government. In this regard, it supplements the information that firms are required by law to submit to the Government. Petro-Canada provides the Government with the additional expertise to interpret and analyze this data, and to evaluate its significance and implications for energy policy.

The "window" vs. the "yardstick"

Oil industry representatives with whom we spoke argued that Petro-Canada was not necessary as a window on the industry because the Federal Government already knows all it could possibly need to know about the industry through mandatory disclosure requirements.

The two positions can be reconciled by recognizing that each side of the controversy is referring to a different type of informational service, and therefore, a different function for Petro-Canada. Earlier we made a distinction between the concepts of the "yardstick" and the "window on the industry." Petro-Canada is intended as a "window" to keep the Government advised on industry activities, developments, trends, and technical issues, assist in evaluating their policy significance, and work with the Government in policy formulation. The company is not expected to be a "yardstick," accurately reflecting the operations of the industry so that the Government can judge the industry's efficiency or the validity of its costs and profits.

A yardstick company would aid the Government in regulating the industry. As noted earlier, it is based on the assumptions that company activity and financial data is either unavailable, out-of-date or inaccurate for some reason, or the collection and analysis process too slow to make policy decisions in a fast-moving industry, and that a mock private company under the Government's watchful eye will reveal accurate information on

company operations. In arguing that Petro-Canada is unnecessary because of disclosure laws, industry critics are seeing Petro-Canada as a yardstick and saying that such a function is unnecessary; therefore, the national oil company is not needed. In fact, Petro-Canada makes no claims to be acting as a yardstick.

Can a national oil company act as a yardstick?

Whether Petro-Canada or any other national oil company could successfully act as a "yardstick," even if assigned this function, is doubtful. During hearings before the Senate Committee on Commerce in 1973 and 1974, witnesses contended that the very nature of a national oil company precludes it from being a valid comparison. They point out that a national company has different --often competing--goals, acts as an instrument of Government policy, and has special privileges or treatment granted by the Government. In Canada's case, the Government contributes to its financing, guarantees loans, and gives it priority in leases on Canadian lands under certain conditions (i.e., the "back-in" provision). Such privileges, it is argued, distort any comparisons with private firms because these operating advantages produce different costs and risks. The fact that Petro-Canada is a policy instrument concerned primarily with national goals, often at the expense of profit maximization, also limits its usefulness as a yardstick to measure private firms' operations. It is also argued that a national oil company's usefulness as a yardstick would be further limited because the performance of one firm does not provide an adequate basis for judging the performance of an entire industry. Performance differences could result from different phases of company development and may merely reflect one company's experience operating in a particular area and under particular circumstances rather than systematic differences in economics or technical proficiency between a national company and private firms. While some proponents believe that the data could be adjusted to correct for these differences through accounting techniques that would eliminate the unique characteristics of the national company, other analysts familiar with the oil industry believe that such adjustments would be futile. In summary, these critics say that to act as a yardstick, a national company must be exactly like a private company, or it must at least be possible to isolate and separate those functions which are exactly like a private company's. These experts contend that a national oil company obviously is not exactly like a private company and individual, private company-like functions cannot be isolated for comparison without distortions.

The counter-argument is that a Government firm can, in fact, act as a yardstick to measure private firm activity. Proponents of that view state that a Government, by either purchasing an existing firm or creating its own, will obtain valuable information on the day-to-day operation of this firm which can then be extrapolated to the entire industry. A noted Canadian economist states that the accuracy of such an extrapolation depends on the correlation between the Government firm's and the private firms' cost schedules. He concludes that a substantial subset of the

relevant factor prices are the same for all firms in any industry and, given equal access to technology, the degree of correlation can be expected to be high. According to this argument, the principal source of variance between cost schedules would be location or specific firm advantages and technologies, but the Government can use information about its company's cost and demand conditions to estimate industry demand and cost schedules. However, the uncertainty as to the cost schedule correlations between public and private firms and the distortions introduced by the Government-owned firm's advantages make the accuracy of such extrapolations highly suspect, according to opponents of such arguments.

If we accept the assertion that a national oil company cannot serve as a viable yardstick, as has been suggested, then an alternative means of acquiring company information must be established. Since Petro-Canada does not provide this specific information, the Canadian Government obtains it through disclosure laws. This, in the view of Canadian Government officials, precludes the need for a yardstick. These disclosure requirements, however, do not replace Petro-Canada's "window" function.

Disclosure laws provide the Government with extensive data on individual companies and their operations. It is undoubtedly true that more company information is acquired by this means than could be provided by Petro-Canada; the company has no "inside information" on the internal workings of other oil companies. The company is not used by the Government as a means for gathering data on other oil companies, and according to an EMR official, Petro-Canada provides "no fundamental data" on these companies. However, the information that is provided by Petro-Canada through its "window" function is of a less company-specific, more industrywide nature than that obtained through disclosure. The information function, however, is only a small portion of Petro-Canada's "window" activities. Petro-Canada also supplies the expertise to evaluate trends and activities in the oil industry. It provides the Government with its viewpoint on energy matters based on a knowledge of the workings of the industry and the impacts that certain policies may have on the industry. These are services which disclosure laws cannot provide to the Government.

It appears that the disclosure laws provided the Canadian Government with sufficient information on individual company performance and similar matters. What the Government lacked was technical expertise and the ability to evaluate more general industry information and its implications for energy policy. In this area the Canadian Government felt the need to become directly involved through Petro-Canada and it has been satisfied with the results. Whether only a national oil company can provide this service or whether a company is the most efficient and effective means of doing so is debatable. Acknowledging that Petro-Canada's role in this regard is useful to the Government, it appears to some that if the Canadian Government were to develop a closer cooperative arrangement with the oil industry, this would give the Government access to any general industry information needed

above that required by law. The expertise and advice on oil and gas industry operations and energy implications could be obtained by the Government hiring former industry personnel or employing expert consultants. These would appear to be viable alternatives to the establishment of a national oil company for this purpose-- and could be considerably less expensive.

Observations

It is evident that governments need certain information on their oil industries in general for policy formulation and on individual oil companies for regulatory and related purposes. Based on the example of Petro-Canada, it appears that a national oil company can provide general information on the oil industry, technical issues, and advice on industry-related matters. It does not appear well suited for providing specific information on other companies or accurate knowledge of their actual costs of oil and gas production.

As in Canada, the U.S. Government collects various types of information on the oil industry for policy and regulatory purposes. If this information is available to the Government from other sources, the Government need not act directly to obtain it.

The need for direct government action to acquire industry information is also determined by the types of information required for policy and regulatory purposes. If it is determined that this information is not available, and cannot be acquired by means other than direct government involvement, then the government can be expected to take some action in this regard. It is then necessary to determine what form of government action will meet the informational needs.

The case of Petro-Canada indicates that a national oil company can only be relied on to provide general industry information, expertise and advice; not definitive insight into individual private company production costs and operations beyond that available through financial and other disclosure requirements. The specific technical data generated by Petro-Canada's operations cannot, according to company officials, be extrapolated and provide fundamental insights into data relevant to other companies' experiences. A study of Petro-Canada suggests that a national oil company cannot provide such information.

CONVENTIONAL OIL AND GAS PRODUCTION

Petro-Canada's performance
in conventional production

As noted earlier, Petro-Canada ranked second in Canadian gas production and eighth in oil production in 1979. The company's production figures of 147 billion cubic feet of gas and 25.8 million barrels of oil and gas liquids accounted for about 5 percent of Canada's total production that year. In 1980, however, production figures decreased to 119 billion cubic feet of gas and 22.7 million barrels of oil.

Canadian oil industry representatives have a wide range of opinions on the relative efficiency of Petro-Canada as a production company. The overall consensus seemed to be that Petro-Canada operates about as efficiently as a private oil company. One oil company official stated, however, that Petro-Canada had lost some of the production capacity of Atlantic Richfield Canada and Pacific Petroleum after their acquisition. If this is true, Petro-Canada, rather than supplying net additions to Canada's production through its participation in the industry, may in fact have decreased Canadian oil and gas production below what it would have been had Arcan and Pacific Petroleum remained private companies.

The cause for such a loss in capacity--if, in fact, it occurred--cannot be easily determined. It might be caused by a natural decline in well productivity, problems in integration of the private companies' operations into Petro-Canada's operations, loss of expertise and management skills due to low morale, inherent lower efficiency in national oil company operations, a decline in Pacific Petroleum's investment just prior to its purchase (as Petro-Canada officials contend), or a number of other factors. No definitive conclusion can be drawn from available information.

A comparison of production figures for the three companies from 1976 through 1980, while inconclusive, indicates that this claim may have some validity in the short term but, overall, the effects appear inconsequential. These figures are shown in table 1.

These production figures demonstrate a small decline in Arcan's oil production after its acquisition by Petro-Canada at the end of 1976. Prior to its acquisition by Petro-Canada, Pacific Petroleum showed an increase in oil production from 1976 to 1977 and then a leveling off through 1978. The total crude oil production for the two firms together in 1976 was 60.7 MBD. In 1977, after Arcan had become Petro-Canada, the total for the two firms increased to 65.5 MBD, based on a slight decrease in the former Arcan's production and an increase in the production of the still private Pacific Petroleum. In 1978, the total oil production for the two companies decreased to 64.8 MBD, due to a slight decrease in Petro-Canada's (formerly Arcan's) production. In 1979, however,

Table 1
Production Figures from Atlantic Richfield Canada (note a),
Pacific Petroleums (note b), and Petro-Canada,
1976-80

Oil
(thousand barrels per day)

	<u>ARCAN</u>	<u>Pacific</u>	<u>Petro-Canada</u>	<u>Total</u>
1976	29.1	31.6	-	60.7
1977	(27.9)	37.6	27.9	65.5
1978	(27.2)	37.6	27.2	64.8
1979	-	-	69.8	69.8
1980	-	-	62.5	62.5

Natural Gas
(million cubic feet per day)

	<u>ARCAN</u>	<u>Pacific</u>	<u>Petro-Canada</u>	<u>Total</u>
1976	90	360	-	450
1977	(86)	361	86	447
1978	(84)	311	84	395
1979	-	-	410	410
1980	-	-	326	326

a/Atlantic Richfield Canada was acquired by Petro-Canada in August 1976.

b/Petro-Canada acquired a 51.6 percent interest in Pacific Petroleums in November 1978, and the remaining interest in February 1979.

SOURCE: Petro-Canada

after Pacific had been acquired by Petro-Canada, total production amounted to 69.8 MBD, the highest rate for the 4-year period. This indicates that the oil production attributable to either Arcan's or Pacific Petroleum's former operations--or both--must have increased in that year under the management of Petro-Canada. In 1980, however, Petro-Canada's oil production declined by 11-percent--from 69.8 MBD in 1979 to 62.5 MBD in 1980. Petro-Canada officials explain this decline as a result of a reduction of markets for heavy oil and some prorating of light and medium crude production. While there is no question that Arcan's oil production declined after Petro-Canada's acquisition of its operations, this decline was not substantial. There is no indication from these figures, however, that Pacific's production declined during the first year after its acquisition by Petro-Canada, and in fact, it appears as if this production increased during that year. The subsequent decline in 1980 was due to market or technical factors, according to Petro-Canada representatives.

In natural gas production, Arcan's operations declined after acquisition by Petro-Canada in both 1977 and 1978. During that same period, prior to its acquisition by Petro-Canada, Pacific's gas production increased slightly in 1977 and then declined considerably in 1978. The total gas production for the privately owned Arcan and Pacific amounted to 450 million cubic feet per day in 1976. In 1977, after Arcan became part of Petro-Canada, the total for the two companies declined slightly to 447 million cf/d, due to the decrease in Arcan's (now Petro-Canada's) production. In 1978, the total gas production for the one public and one private firm dropped significantly to 395 million cf/d, attributable to a slight decline in Petro-Canada's production but primarily to a sharp drop in Pacific's production. In 1979, however, after both Arcan and Pacific were both a part of Petro-Canada, total natural gas production for the former Arcan and Pacific operations increased over that of the previous year to 410 million cf/d. Again, this increase must be attributed to an increase in the production of operations previously belonging to either Arcan or Pacific, or both.

In 1980, however, natural gas production fell by 19 percent over that of the previous year. According to Petro-Canada officials, this decline was the result of external factors such as a severe reduction in export demand, rather than any internal company management or technical production problems.

While it is evident that in the short term, Arcan's production declined slightly after its acquisition by Petro-Canada, the reason for this decline is not apparent. Some critics would attribute the decline to inefficiency or poor management by Petro-Canada. This is one possible explanation, but it is by no means certain nor is it the only possible explanation. It could be attributed to any number of either technical or managerial problems. If we were to assume, however, that these critics are correct and that the decline was caused by some inefficiency within Petro-Canada, the magnitude of the decline would suggest that this was not a serious problem, since production did not drop drastically. In addition,

the increase in total production in later years suggests that the alleged inefficiency was subsequently corrected. As noted, the most recent production declines appear to be the result of external factors beyond the company's control rather than the outcome of internal inefficiencies.

Most industry representatives felt that Petro-Canada had not added any oil to the Canadian supply that would not have been provided by private companies. In conventional areas, Petro-Canada is competing directly with private companies, and many of these feel that it should not; that it is not necessary for a Government firm to be doing what private companies are already doing effectively.

The Canadian Government felt the need to become directly involved in conventional oil production through Petro-Canada to acquire expertise, to increase Canadian ownership of the oil industry, and to generate funds to develop nonconventional resources. Petro-Canada maintains its conventional production to continue developing expertise but primarily to finance its nonconventional activities. Petro-Canada is concerned with operating efficiently and making profits on these activities (which it does) but principally as a source of income for funding its nonconventional activities.

The Canadian Federal Government representatives and Petro-Canada officials we interviewed did not claim that Petro-Canada was needed in conventional activities to increase production because private companies were not performing adequately. Generally, it is recognized that private oil companies are producing oil and gas at an acceptable rate. For Canada, there was not a generally perceived need for a national oil company to make up for inadequate domestic conventional production. Petro-Canada is merely involved in these activities to establish expertise and make profits like any private company and on the same terms as any private company. The fact that private companies resent the competition may be an indication that Petro-Canada is a reasonably effective producer.

The need for Petro-Canada in conventional production

Regardless of the relative efficiency of Petro-Canada as a conventional oil and gas producer, the question of the need for a national oil company for this purpose naturally arises. Does the contribution by Petro-Canada to Canada's oil supply justify the expense to the public of its operations? As noted, Petro-Canada makes no claim to making net additions to supply; it is involved in conventional activities for the expertise acquired and the funds generated for nonconventional activities. The question arises as to the usefulness of a national oil company that merely supplies oil and gas that could and would be supplied by private companies anyway. As far as the support provided to developing nonconventional resources, it would appear that the capital which was used to purchase Pacific Petroleum and Arcan and is invested to maintain these operations could be funneled directly

from the Government in support of nonconventional resource development. The conventional activities of Petro-Canada could be left to private companies. The expertise obtained from Petro-Canada's activities might be acquired by the Government in other, less expensive ways.

Can a national oil company
increase conventional production?

It has been claimed that any national oil company is inherently inefficient and will, therefore, result in less production than a private firm. In defense of this position, oil industry critics argue that economic analysis generally supports the contention that public ownership alone causes a firm to operate less efficiently than its private counterparts. A discussion paper produced by the American Petroleum Institute ^{1/} asserts that a public firm will operate relatively less efficiently because a public owner cannot sell its ownership shares while a private owner may sell or buy ownership rights. The absence of a market for a public firm's shares reduces the availability of information as to how well or poorly the company performs. The inability to transfer shares, according to this argument, precludes the opportunity for ownership specialization, an important means of detecting and correcting poor management, and tends to reduce the efficiency of the public company. The argument concludes that the inability to transfer ownership shares in a public company results in fewer constraints on the ability of public corporation managers to deviate from profit maximizing behavior than on private managers. The result is reduced economic efficiency as managers pursue non-wealth producing goals.

The API also argues that studies of government-owned firms in general show that politicians and bureaucrats seek to influence these firms to meet goals unrelated to economic efficiency and which deviate from maximization of the economic value of the firm's resources. Such political interference with the operations of a public corporation, it is argued, will further reduce its economic efficiency as compared to a private corporation.

The API study applies these arguments to the case of a national oil company and concludes that a government-owned oil firm would not be expected to produce petroleum as economically and efficiently as a private firm because

--government ownership per se is expected to reduce efficiency and

--pressures to meet political goals are inevitable and will further reduce its economic efficiency.

1/Ursula Guerrieri, The Debate Over Establishing a National Oil Company in the U.S., Discussion Paper #016, January 9, 1979, American Petroleum Institute.

The API acknowledges, however, that comparative data is sparse and more data are needed to make a comprehensive comparison of the performance of public versus private energy companies.

Critics argue that such alleged inefficiency necessarily affects the relative amounts of petroleum produced. A national oil company has higher operating costs than a private firm with comparable output. Therefore, a government-owned oil company would be expected to produce less petroleum than a private company using equivalent resources and manpower.

The API paper notes that it is possible for a national oil company to increase domestic production but only by subsidizing uneconomic petroleum production by the public firm. According to this study, as long as the government is willing to subsidize oil production whose cost exceeds price, then the national company's production is constrained only by government policy and not by economic factors. Based on this logic it is argued that, if it is agreed that inefficient domestic oil production should be subsidized, then equivalent subsidies to private producers would likely yield higher production. This would occur "because private producers, having lower costs, could produce more at any level of subsidy than a higher cost national oil company."

Petro-Canada: An efficient or inefficient producer?

Based on the preceding arguments, the case supporting the relative inefficiency of national oil companies appears to be strong. However, while Petro-Canada officials would argue that their company is not less efficient than a private firm in the production of conventional oil and gas--and most private oil company representatives we interviewed would likely agree--they would argue that, inefficient or not, these activities are primarily a source for developing experience, reducing Canadian reliance on U.S. companies, and financing nonconventional activities. While it is true that the greater the efficiency of Petro-Canada's conventional operations, the greater the profits and the larger the amount of funds available for nonconventional activities, profit maximization is not the company's primary concern. Government and Petro-Canada officials believe--and many proponents of national oil companies argue--that the social benefits provided by nonconventional production far outweigh losses which might arise due to economic inefficiencies in conventional production. It can also be argued that the addition to Canadian oil and gas supplies in the long run by Petro-Canada's nonconventional tar sands, heavy oil, and frontier activities make any losses from alleged inefficiency in its conventional activities inconsequential.

The justification, or at least explanation, for any possible inefficiency in Petro-Canada's conventional activities is its competing goals. The very nature of Petro-Canada's role as an instrument of Government policy dictates that it perform certain functions that are in the national interest but which may not be profitable or economically efficient. Economic efficiency is not

the company's primary goal. Nor is maximization of its own conventional production in areas where private companies are also active. The primary goal is to serve national ends as dictated by the Federal Government.

Thus, there is a strong possibility that a national oil company is inherently less efficient than a private firm in conventional oil activities. Establishing a government-owned company with the primary goal to increase domestic oil and gas production would seem to be advisable only under the most severe circumstances. A national oil company would be justified in a case where the private firms clearly are not producing sufficiently and inefficient production is preferable to little or no production. The assumption here is that private firms are failing to produce for reasons other than their own inefficiency because they could not long survive as inefficient profit maximizers. The above arguments indicate that any subsidies that would be provided by the government in support of inefficient national oil company production could bring about better results if given to private companies already active in these areas. With this in mind, it would appear that, as far as conventional production is concerned, the Canadian public may be better served by subsidies to private companies than to Petro-Canada. On the other hand, Petro-Canada's nonconventional activities would suffer as an important source of its financing was eliminated.

Observations

One important reason for Petro-Canada's conventional oil activities is to increase the percentage of Canadian ownership in the industry. By purchasing Arcan and Pacific Petroleum, Petro-Canada not only established a presence in the industry but also increased Canadian ownership. In this regard, Petro-Canada holds no relevance for the U.S. situation; the U.S. oil industry is predominantly U.S.-owned. A national oil company to increase U.S. ownership by buying foreign private firms is clearly unnecessary.

As with our previous assessments, we must caution that no firm conclusions as to the efficiency of national oil companies and their net contribution to domestic production can be derived from theoretical arguments and the analysis of only one case study. Additional comparative data is needed.

CHAPTER 7

AN IMPORTING ENTITY

Assessing the experience of Petro-Canada as an importing entity is difficult because there is only one example--the Mexican oil agreement--on which to base an evaluation. In addition, it is virtually impossible to prove that a given supply of imported oil is "secure." Security of supply is something that a country can never be sure of having until it is tested and proved lacking. Just how secure Mexican oil is to Canada is particularly difficult to determine.

Petro-Canada acted as an agent of the Canadian Government for working out technical matters with PEMEX (Petroleos Mexicanos), the Mexican national oil company, and actually delivering and distributing the agreed-upon supplies. The agreement itself was negotiated by the representatives of the respective Governments. Therefore, the success of Canada in obtaining additional supplies of imported oil and their relative security must center primarily around the Federal Government and Petro-Canada only secondarily.

The Canadian Government's success in negotiating for oil imports

The Canadian Government can be credited with obtaining a supply of oil from Mexico which private companies had chosen not to buy, according to Petro-Canada, Government officials and industry representatives. The agreement provided a small amount of oil that would not have been supplied otherwise because private companies were not interested in purchasing Mexican oil on the Mexicans' standard terms. According to Petro-Canada officials, several private companies had previously negotiated for oil imports from Mexico, but failed to complete an agreement. Under those circumstances, the Government can accurately claim that this agreement provided additional oil--however small an amount--that private companies would not have provided.

The oil Petro-Canada contracted for was purchased at the Mexican posted price and is relatively high in sulfur content, according to Petro-Canada officials. The Mexican Government stipulates a specific mix of crude gravities in its agreements with purchasers, and this mix was offered to both Petro-Canada and the private companies. The Government required that Canada take a mixture of 55 percent heavy crude (Mayan-22 to 24 degrees gravity API; sulfur content: 2.4 to 3.0 percent) and 45 percent light crude (Isthmus-32 to 34 degrees; sulfur content 1.6 to 1.8 percent). This is an effort to conserve the more desirable light crude and increase the take of less desirable heavy crudes, a common practice among producing countries. Petro-Canada officials point out that this mixture is not greatly different from that required by Venezuela, the source of much of Canada's imported oil. It should be noted that the actual percentage of heavy to

light crude is not fixed, but is subject to changes in Mexican production, according to Petro-Canada officials.

Company representatives also noted that the oil is oversubscribed by Canadian refiners. Private companies have put in bids for this oil amounting to 150 MBD--three times the actual volume of oil purchased--for their refineries. One private company representative stated that the reason for oversubscription was that the oil was subsidized to the refiners by the Government, so naturally they would want to accept it. Petro-Canada representatives deny this; refiners will pay an average per barrel cost for the Mexican oil and are not subsidized. The explanation for the oversubscription, according to Petro-Canada officials, is that some Canadian refiners are concerned about insecurity of supplies of oil and regard this supply as dependable.

Since several private companies negotiated for Mexican oil but did not agree to the quality and price of crude offered, and since Petro-Canada subsequently completed an agreement on comparable terms, this seems to imply that the national company may have made a "bad deal." Explanations provided by both Petro-Canada and private industry representatives indicate, however, that this is not an accurate interpretation. Private oil company representatives stated that they rejected the oil offered by Mexico because of its poor quality (high sulfur content) and high price--relative to that of supplies available to them from other sources. Likewise, Petro-Canada officials stated that the Mexican oil purchased by Petro-Canada is relatively expensive and of low quality. The key question, however, is relative to what. Many Canadian refiners currently have access to Saudi Arabian Light Crude which is lighter, lower in sulfur content, and less expensive than that offered by Mexico. Understandably, many of these refiners prefer Saudi Arabian over Mexican oil as long as it is available, and therefore, were not interested in a Mexican agreement. On the other hand, some refiners, including those with access to Saudi Light, are concerned about the continued availability of these supplies, and are thus interested in diversifying sources of imports. This explains the oversubscription of Petro-Canada's Mexican oil.

A representative of one Canadian subsidiary of a large multinational company which negotiated for Mexican oil explained that his company processed Mexican crude oil, both for test purposes and in normal operations. The oil is supplied by another of the multinational's subsidiaries. Recognizing the potential desirability of a direct supply of crude from Mexico, preliminary discussions were held with PEMEX. However, when it became apparent that the price for Mexican oil was high on a quality-adjusted basis, compared to other crude oil then available, no agreement was completed.

The agreement between the Mexican and Canadian Governments illustrates a difference in the priorities of government-owned and private companies. We can infer from the Canadian

Government's willingness to complete an agreement which private companies found unattractive that the Government's--and therefore Petro-Canada's--primary concern was that the Mexican oil was potentially more secure than oil from other sources. The private company, on the other hand, appears to have been primarily motivated by cost and profit considerations, causing it to reject an agreement. This does not mean, however, that the private company was not concerned with security of supplies merely because it rejected the oil in this instance. In addition to finding Mexican oil relatively more expensive than that of other suppliers, company officials may have perceived Mexico as a potentially less secure source of oil than did Canadian Government officials, or than the private company's other suppliers, based on a long-established relationship. It does appear, however, that security of supply may be a somewhat stronger motive in the case of the public firm.

The Canadian Government has been criticized for the small amount of oil which the Mexican agreement will actually provide-- 50 MBD. In 1980, Canada's average daily oil consumption was 1.7 MMBD. Its average daily gross crude imports were 558 MBD. Therefore, the 50 MBD per day of Mexican oil imports is equal to 3 percent of daily consumption and 9 percent of 1980 daily gross crude imports. Petro-Canada and Government officials defend the volume of oil involved in the deal as being a net addition to supplies, regardless of how small it is.

The agreement's principal contribution

Petro-Canada officials and Government representatives believe that this agreement provides at least a marginal improvement in imported oil security. Officials believe that there is, in fact, an improvement in supply security through direct government-to-government agreements and also through diversification of supply sources. With this in mind, they feel that the Mexican agreement, regardless of the quality, quantity, or price involved, sets a precedent for direct Government oil deals in the future. This is the purchase agreement's main significance.

To understand the Canadian view of direct government-to-government agreements for oil imports, we must look at the arguments in favor of such deals as a means of assuring more secure supplies. The first argument in favor of such agreements is that producer governments have a preference for state-to-state agreements on oil. The trend is for producers to circumvent private oil companies, take control of their resources and control more production and exporting through their state oil companies. It seems logical that consumers also should have national oil companies to deal directly with their foreign counterparts.

Another argument for direct government agreements is a general distrust of private oil companies by both producer and consumer countries. As noted above, producer countries want greater control over their resources and generally believe that multinational companies have been exploiting their resources.

Consumer countries, on the other hand, often believe that multinational private oil companies have been responsible for oil shortages and other related problems. In the case of Canada, the country is particularly sensitive to reliance on foreign-owned oil companies for their oil supplies. Many believe that the primary concern of these companies is profit and that they do not have the national interest of Canada in mind. Canada's reliance on these companies for imports of such a crucial commodity as oil leaves the country in a very vulnerable position.

Canada's vulnerability was demonstrated during the Iranian oil cutoff in 1979. When supplies from Iran were disrupted and shortages began in many countries, Exxon instructed its Canadian subsidiary, Imperial Oil, to transfer some imports from Venezuela away from Canada to one of Exxon's other customers in Europe suffering from a shortfall. If these supplies had been in the hands of a government-owned company like Petro-Canada, they could not have been diverted to the detriment of Canada.

The alternative argument is often presented--that a private, multinational oil company with operations all over the world has flexibility to transfer supplies from one area to another which could not be done by a national oil company. The above case demonstrates the truth in this argument: if Canada were to experience a serious shortfall, Imperial (or Exxon) could allocate supplies to Canada from another area. But, as the above case shows, there is no guarantee that Canada's national interests will be primary for a foreign private company.

Another argument against state companies is that private oil companies act as a "buffer" between producing and consuming countries. Proponents of this argument state that direct government-to-government negotiations on oil holds the potential for introducing political factors into what should normally be a commercial transaction. According to this thinking, by placing a private company between the producing and consuming government, the political effects are lessened. The multinational oil companies have a certain amount of flexibility. As demonstrated in the 1973 oil embargo, multinationals can shuffle supplies among different consumers as the need arises. If a producer were to refuse Canada supplies, a multinational oil company, theoretically could shift supplies from another producer to Canada without any harm to that country. If the producing country was dealing directly with Canada and its national oil company, any supply cutoff aimed at Canada would force Canada to scramble to find alternative sources for the lost oil. This further strengthens the argument that reliance solely on a national oil company for supplies is tantamount to "putting all your eggs in one basket." If supplies are denied to Petro-Canada for some reason and Canada has no imports handled by multinationals, it will likely experience a serious shortfall.

The alternative argument is also offered, however: private oil companies are not needed to import oil. The producer countries for the most part own the oil--not private oil

companies. The Venezuelan Government owns the oil Imperial delivers to Canada; Imperial is merely acting as a middleman. Canada could purchase oil directly from the producing country without Imperial's involvement. Petro-Canada can just as easily act as a middleman--one which the Government can control. Under these circumstances where the private multinationals are losing control of the oil market the "buffer" provided by these companies will be of little help in manipulating oil supplies to compensate for cut-offs. Their flexibility is becoming more and more limited.

Another argument offered in favor of direct government participation is that it will provide the consumer government with greater bargaining power. The argument is that governmental prestige and power are injected into the negotiations and make for a more favorable outcome. The transaction becomes a formal political relationship rather than merely an economic one. It cannot be denied that oil is--and has been since at least 1973--a political as well as an economic commodity. By formally elevating the transaction to a political (e.g., government-to-government) status, it demonstrates the reality of the situation and the critical importance of oil to the political and security needs of both producer and consumer nations.

As oil import arrangements become matters between governments, however, further complications are introduced. The political aspects of the transaction may begin to take precedence. On the one hand, involving the government in negotiations may be beneficial from the consumer's point of view. Government involvement may help supply security since the producing country may be reluctant to directly confront the consumer government by limiting or cutting off supplies. This effect depends very much on the countries involved. The producer may be reluctant to alter supplies after agreement either for fear of retaliation or because the producer is interested in staying in the good graces of the consumer. Or the producer may avoid any disruption out of a sense of obligation to an international commitment once reached. Whatever the reasons, consumer government prestige and power may influence producers to honor supply agreements and thereby ensure consumers a secure source of imported oil.

On the other hand, direct government participation in oil importing agreements may have adverse effects on negotiations and, ultimately, on the security of supply. The political nature of the transaction, here again, may become primary. Depending on the relationship between the countries involved, direct negotiations and agreements may introduce the possibility of political blackmail. The producer country may try to exact concessions from the consumer in return for oil supplies. These concessions might include anything from technology transfers to some type of military or political concession. During the negotiating stages, this may complicate agreement. If demands are presented after agreement has been reached, the consumer may be faced with a choice of risking a cutoff or submitting to the producer's demands. Another possibility is that a

producer government, because of past differences with a particular consumer, may simply refuse to even consider selling oil to that country. These are cases where a private company "buffer" would be useful.

The Canadian Government, as noted earlier, believes that the agreement with Mexico will enhance the security of supply of oil from that country. This is based, presumably, on its assessment of Mexico's reliability, sense of obligation to its agreements, and the good relations between the two countries.

Petro-Canada representatives attribute its success partly to the Mexican Government's preference for dealing directly with consumer governments through national oil companies. This is a good example of the argument that governments' direct participation in oil importing arrangements is beneficial because of producer governments' preferences for such agreements, the general trend in that direction, and the additional bargaining power of the consumer due to the power and prestige of the government. The actual relative weights of these factors in determining the outcome of the negotiations is uncertain, but it is likely that all three factors influenced the successful completion of the agreement.

Based on the preceding arguments, it appears that the Canadian Government was successful in obtaining a small amount of additional crude oil of acceptable quality at the normal Mexican price. Beyond the amount of oil involved, Petro-Canada and Government officials argue that the Mexican agreement is significant in that it sets the precedent for future oil import arrangements between Canada and other producing governments. In fact, in response to a recent offer from Saudi Arabia, the Canadian Government is currently exploring the possibility of importing 100 MBD of Saudi crude.

Did direct Canadian Government negotiation ensure more secure supplies of oil?

The principal factor prompting the Canadian Government to become directly involved in oil imports was concern for the security of imported oil. Whether security has been improved through the Mexican agreement remains to be seen. There is some evidence, however, that the agreement with Mexico may not provide unquestionably dependable and uninterrupted supplies of oil to Canada. The original agreement between the Canadian and Mexican Governments was for the sale of 100 MBD of crude. Later, the Mexican Government unilaterally decided to halve the amount offered to Canada. Canada, with a choice of taking or leaving this amount, accepted the 50 MBD. This alteration of the terms after agreement does not prove that these supplies are insecure, but it does emphasize that Mexico maintains control over supplies and has the power to alter terms of the agreement at its discretion. The producer can always opt to keep its oil and there is little or nothing the purchaser can do to prevent this. Neither Canada nor any other importer can be certain that any source is

secure because of the numerous political and economic factors influencing security. One of the best means of ensuring against vulnerability to import supply disruptions is to increase the number of suppliers and, particularly, to seek ones whose reliability, based on past performance, appears most assured. This is what Canada is attempting to do.

This raises the question of whether security of supply can be assured by means other than direct government involvement or whether such direct involvement is a necessary or sufficient prerequisite for supply security.

The example of the Canadian experience with government-to-government agreements on oil imports does not provide us with sufficient information to determine if the Canadian Government has been able to obtain more secure supplies from Mexico or if such involvement is either helpful or necessary in this regard. The most definitive statement we can make, based on the Canadian example, is that it is possible for a consumer government to negotiate directly with a producer government and successfully agree to the importation of additional amounts of crude oil.

The important question for both Canada and the United States is not whether additional imports can be obtained by this means but whether these supplies are more secure. Few can deny that both countries rely on imported oil and that the security of these supplies is of the utmost importance to both. This is a sufficient justification for government involvement in trying to secure dependable supplies of oil. To establish a basis for either U.S. or Canadian involvement in securing imports, we must merely acknowledge that oil supplies obtained by private oil companies are insecure. Once this need is determined, we must consider whether direct government involvement will, in fact, make these supplies more secure.

Insecurity of oil imports

In the Canadian case, the insecurity of supply handled by private companies was illustrated in 1979. As noted above, during the Iranian supply disruption, Imperial Oil--on the orders of its parent company, Exxon--diverted Venezuelan oil destined for Canada to other customers in Europe. In the United States, the disruptions and shortages during the Arab embargo of 1973 and the Iranian revolution illustrate the insecurity of oil supplies under the present system where the United States relies solely on private companies for oil. Obviously, the principal responsibility for the disruptions lies with the producing countries. But the potential for private oil companies to manipulate oil supplies, to either the benefit or detriment of a particular consumer country, adds a degree of uncertainty to the entire oil supply situation. Private companies may not always be depended on to work in the public's best interest when it conflicts with their own.

More important than any manipulation of supplies by oil companies are the disruptions or cutbacks initiated by producer governments. Private companies and consumer governments have little or no control over exporters' production and exporting decisions. Producer disruptions and production cutbacks may arise as a result of technical problems in fields or producer government decisions to conserve resources. Such supply disruptions have also been the result of politically motivated decisions by producers or political upheavals and violence within or between producers. These are factors over which consumers have very little, if any, control.

Do state-to-state agreements
require a national oil company?

The primary role in negotiating the Canadian-Mexican agreement was played by the Government; Petro-Canada worked out the technical details and is responsible for delivery and distribution of the oil. Petro-Canada was directed by the Government to handle these responsibilities, and it appears that the Mexican Government favored the deal with the national company. Was Petro-Canada necessary for this agreement? Technically, it would appear that any oil company would be capable of acting as the delivery and distribution agent of this oil for the Government. The Government could arrange with a producer country for supplies and then permit private companies to purchase and distribute the oil. This would eliminate the need for a national oil company. However, such an arrangement would likely diminish the government's control over these supplies. Removing Petro-Canada as an actor would not remove the problems inherent in government-to-government negotiations and dependence on private oil companies to handle oil supplies. On the other hand, if Mexico would only sell its oil to a national company, then Petro-Canada's involvement was necessary. However, there is no evidence that the Canadian Government's direct participation in such negotiations has substantially increased the security of Canadian oil imports.

Observations

The Canadian example demonstrates that governments can successfully negotiate agreements with producers for the importation of crude oil and that a national oil company may act as the instrument to implement such an agreement. However, it does not appear that a national oil company is essential for this process. Other options are available to implement government-to-government agreements. The degree to which oil supplies become more secure through direct government agreements such as that between Canada and Mexico is uncertain because of the diverse technical and political factors involved.

An alternative approach which may provide increased security for consumers is the establishment of strategic oil reserves to protect against potential supply disruptions or shortages. Since

neither direct government agreements nor the participation of multinational oil companies can guarantee uninterrupted flows of oil imports, contingency preparations such as strategic reserves may be the most viable protection against insecure oil supplies.

"SOCIAL BENEFIT" ACTIVITIES

Petro-Canada representatives and Canadian Federal Government officials believe that Petro-Canada's most significant--and most successful--contribution to improving Canada's energy situation has been through its activities in accelerating the development of nonconventional resources. As noted earlier, these activities involve participating in nonconventional areas such as tar sands production, exploration and production in hostile, high-risk, high-cost frontier areas (particularly in the Arctic, Northwest Territories, and offshore East Coast areas), and research and development of heavy oil recovery techniques. In these areas, Petro-Canada has invested in activities which are currently unattractive to private companies but crucial to Canada's energy needs. By its own investment, Petro-Canada has acted as a catalyst to stimulate private investment, accelerating the development of these resources.

Petro-Canada's financial contribution

Although Petro-Canada enters nonconventional ventures as an actual operating participant, its principal contribution is financial. By infusing investment funds into a venture, Petro-Canada lowers both the costs and the risks to the other participating companies.

The importance of Petro-Canada's financial contribution in developing nonconventional supplies of oil and gas derives from several factors. Developing these sources requires capital intensive projects having substantially higher unit costs than conventional production. These projects are also large compared to the investments made by most individual companies in the oil industry. Many of these nonconventional projects involve substantial risks. Some use new technology, others operate in hostile environments having little or no infrastructure and where there is little previous operating experience. Many of Canada's nonconventional projects, like tar sands development and frontier exploration, involve technology never before used on a commercial scale in Canada. There are long leadtimes from the original commitments to start-up and financial payback. All of these factors add uncertainty and costs to Canada's nonconventional projects.

Massive amounts of capital must be mobilized for these projects. If the combination of price uncertainty, cost exposure, and technical risk are too great for private investors and lenders to absorb, development of these nonconventional projects will be delayed. When these delays impede progress toward Canada's energy goals and, therefore, run counter to the national interest, the public must assume some of the risk and costs of future supplies. This is exactly Petro-Canada's role.

The Federal Government, through Petro-Canada, is assuming a share of the risk involved in these nonconventional projects, reducing the risk carried by private companies to a more manageable size. The public, through Petro-Canada, puts financial support behind risky energy projects and will share in the profits, both financially and through increased energy output. The private investors receive profits commensurate with their share of the project. Through its participation, Petro-Canada helps to shift investment funds toward areas deemed crucial to meet Canada's future energy needs. As these funds are allocated to the nonconventional areas, these projects will come online more rapidly than they would otherwise.

The benefits to the Government--and ultimately, the public--of Petro-Canada's investments are numerous. Such participation

- mobilizes investment funds for the exploratory and technical work required in frontier areas;
- permits the Government to influence the pace of investment in nationally important energy projects by taking the initiative where necessary. This can focus the necessary inputs more effectively than can general fiscal measures alone;
- provides the Government a chance to learn about the risks and opportunities available in the energy area from the practical experience as an equity risk-taker and to formulate energy policies from that informed background;
- concentrates on opening investment opportunities for private oil companies in new projects; and especially allows Canadian companies to participate in ventures which might otherwise exclude them due to their small size relative to foreign-controlled firms.

Petro-Canada devotes a disproportionately large amount of its expenditures to frontier exploration, project feasibility studies and related research, frontier technology development, and to major projects like Syncrude than a private company of its financial strength and size could. This derives from the company's government backing and its role as an instrument of public policy implementation.

As noted previously, Petro-Canada finances its nonconventional activities not only with Government funds but also with income derived from its conventional oil and gas operations. The sources and disposition of Petro-Canada's funds for 1980 are illustrated in table 3.

Table 2

Petro-Canada's Sources and Uses of Funds - 1980

<u>Sources</u>	(millions \$)	<u>Uses</u>	(million \$)
Working capital from operations	457.6	Decrease in working capital	- 50.9
Natural gas paid for but not taken	19.9	Syncrude Project and other bituminous sands projects	29.0
Shares issued to Government of Canada	<u>80.0</u>	Oil/gas exploration/development	360.6
		Other corporate assets	19.2
		PEX preferred share dividends	107.9
		Reduction of long-term debt	60.8
		Refining and marketing	14.3
		Investment (mainly Panarctic)	10.2
		Natural gas liquids	1.2
		Polar gas, heavy oil Arctic LNG and other feasibility studies (deferred charges)	<u>5.0</u>
<u>Total</u>	<u>557.5</u>		<u>557.5</u>

It should be noted that the largest single source of funds was working capital from operations. The largest investment was in oil and gas exploration and development activities, much of which went to frontier exploration and development. Other nonconventional activities in which Petro-Canada invested included the Syncrude Project and Polar Gas, heavy oil, Arctic LNG and other feasibility charges.

Company officials stated that one of the primary justifications for Petro-Canada's purchase of Arcan and Pacific Petroleum was to obtain profitable operations to fund its currently unprofitable nonconventional operations. By this means, Canada lessens the the cost to taxpayers of developing nonconventional resources by shifting the cost to oil consumers.

The need for Petro-Canada in nonconventional activities

Few oil industry representatives we interviewed denied 'that' Petro-Canada has been successful in speeding development of oil in frontier areas. Some industry critics argued that Petro-Canada was not needed to stimulate investment in nonconventional areas; that private companies would become more interested and gradually invest in these activities as they become more economically attractive. Petro-Canada representatives admit the truth in this argument but stress that Canada cannot afford to wait for private companies to become sufficiently interested to begin developing nonconventional resources--Canada's interest requires bringing these resources on-line as soon as possible. This is what Petro-Canada is doing.

Some Canadian oil industry spokesmen claimed that in certain frontier areas private companies were already actively exploring for oil when Petro-Canada, through its special privileges, backed into portions of their leases, thereby letting private companies do all the work with Petro-Canada coming in for the payoff. Both Petro-Canada and Government officials refute this, stressing that the "back-in" provision allows the company to move into a lease held by a private company only after the private firm has held the lease for 12 years and has made no significant discoveries. The utilization of this provision is predicated on the Government's assessment that a private firm has not been sufficiently active or successful in working the lease and that some effort is necessary to ensure increased exploration on these lands.

We have previously noted several examples of areas where Petro-Canada has been successful as a catalyst and thus in serving its "social benefit" function. These include increased investment in the Arctic Islands and off the East Coast of Canada where investment had previously been lagging. In addition, we have noted Petro-Canada's contribution to the development of tar sands and heavy oil. That these activities are sufficiently important to warrant direct Government support cannot be denied. It seems evident from the Canadian example that, because of the currently unprofitable nature of such nonconventional activities, private oil companies cannot generally be depended on to invest in these areas on a large enough scale. This indicates a need for direct Government action to stimulate investment in these resources. But is a national oil company the most efficient, effective means for the Government to stimulate such investment?

To determine whether a national oil company should be the Government's principal instrument for increasing investment in nonconventional resources, and thereby, speeding their development, we must first analyze how it operates in this capacity. The case of Petro-Canada provides a good illustration of this.

Petro-Canada as a catalyst in
frontier exploration and development

Petro-Canada's catalyst activities center around arranging consortia to pursue nonconventional projects which are too expensive or too risky for private firms to carry out alone. Petro-Canada lowers the costs and risks to its private sector partners by assuming a considerable portion of them.

Petro-Canada officials have offered several examples illustrating the company's success as a catalyst. Panarctic was very successful in the early 1970s and "proved up" approximately 15 trillion cubic feet of gas. After 1975, however, the success level declined markedly. According to company officials, only the active participation of Petro-Canada kept activity going. Petro-Canada has contributed up to 80 percent of recent Panarctic financing. During 1979, Panarctic, the only company drilling in the Arctic Islands, completed nine wells. This resulted in the successful Whitefish discovery in late 1979 which was verified by further drilling in early 1980. Petro-Canada officials believe that had Petro-Canada not contributed a disproportionate share of exploration dollars in the Arctic Islands, it is likely that exploration activity would have sharply declined over the past three years. Petro-Canada continues to fund Panarctic activities at a rate in excess of its 50-percent ownership. At the beginning of 1980, Petro-Canada planned to finance 81.2 percent of the Panarctic budget for 1980-81 to ensure that the necessary level of activity is maintained. According to Petro-Canada spokesmen, this resulted from a lack of commitment from the private sector partners in Panarctic to continue funding their shares.

Off the East Coast of Canada--an area characterized by hostile conditions--exploration activities by the oil industry reached a peak in 1973. Exploration started to decline and was lagging by late 1976 because of meager exploration success. As a result, exploration funds were diverted from the East Coast and many companies decided to farm out their interests.

In 1976, Petro-Canada began to explore in the area and by the end of 1979 the company had invested \$130 million and participated in the majority of the wells drilled. Of the total expenditure, \$65 million was spent on the Scotian Shelf, accounting for 70 percent of the total industry expenditures in this area, and \$65 million on the Labrador and Newfoundland Shelf, representing 30 percent of industry expenditures there. Petro-Canada officials believe that the upswing of exploration in 1978 and 1979 was clearly a result of two factors: Petro-Canada's financial participation and the Frontier Exploration Allowance (or "super depletion" 1/). Which played a larger role is uncertain.

1/This tax deduction provided oil companies with an additional 66-2/3 percent write-off on all drilling costs in excess of \$5 million per well.

An example of Petro-Canada's contribution to frontier development is its activity in the Scotian Shelf off Nova Scotia. According to Petro-Canada representatives, the oil industry had spent in excess of \$100 million in the Scotian Shelf, drilling 57 wells. By 1974, however, exploration activity had virtually ceased because of discouraging results. Petro-Canada felt that it was too early to abandon exploration in this area, particularly since Eastern Canada was so dependent on imported oil. If oil and gas were actually found here, it could easily and relatively inexpensively be brought ashore. Consequently, Petro-Canada, along with Kaiser Resources, Inc., "farmed-in" on acreage near Sable Island held by Shell and Mobil and ultimately made a successful major gas discovery at the Venture well in 1979. Petro-Canada paid 75-percent of the \$55 million cost of the program and holds a 30 percent interest in the leases. The Venture well flowed gas in quantities which may prove to be commercial. Referring to this discovery, Petro-Canada's Chairman Hopper told the Standing Committee on Natural Resources in November 1979, "I have no qualms in stating unequivocally that, without the presence of Petro-Canada in the Sable Island area from 1976 onward, Canada would not be so close to having an economic source of natural gas to supply this critical energy short area."

In the Newfoundland and Labrador offshore areas, the industry invested over \$250 million to drill 10 wells in 1979. Petro-Canada participated in 9 of these. Petro-Canada participated in a major program with the Labrador Group operated by Total Eastcan Exploration Ltd., resulting in an aggressive exploration program. The company has acquired a major land position, and early in 1980 took over as operator of the Labrador group.

The most significant discovery in Canada's frontier regions to date is the Hibernia well off the Grand Banks in which Petro-Canada has a 25-percent working interest. Exploration drilling on the North Grand Banks started in 1972. It came to an end in 1975 after eleven disappointments. From 1975 to 1979, this area was idle in spite of early indications of oil potential. On January 15, 1978, when 4 million acres of federal permits expired, those leases were then re-issued in the form of a Special Renewal Permit. Because of insufficient Canadian content as designated under Section 120 of the Canada Oil and Gas Regulations, Petro-Canada "backed-in" to a 25-percent working interest. This interest was subject to Petro-Canada's participation in the negotiated work program which started with geophysical studies in 1978. The Hibernia well, which included Chevron as operator, and Mobil and Gulf as well as Petro-Canada as participants, is estimated to be capable of eventually producing more than 190 MBD of oil.

Before Petro-Canada became active in Canada's frontier areas, exploration by private firms had begun to taper off because of low success rates and high costs. A principal reason for this decline was the inability of the many private firms to efficiently and equitably share information. For the most part, private companies were drilling alone or in small groups. Each group was isolated and had an obvious incentive to hold off drilling until

others had drilled, providing valuable information in this high-cost environment. This disincentive kept drilling down, and there was no agent for organizing and coordinating exploration information among these small consortia. Petro-Canada is now serving as such an agent. Thus, besides its financial support, the company stimulates private investment by forming consortia and coordinating information among participating companies.

Both actions lower costs and risks relative to the more uncoordinated exploration which took place before. The justification for Government intervention in frontier exploration and development centers around the contention that the Government needs reliable information on oil and gas reserves to formulate appropriate national energy policies. The Government also feels it is necessary to speed development of resources located in frontier areas to meet future energy needs. Accurate information for policy purposes and, of course, future development of these resources requires exploration. As noted, these areas were not being sufficiently explored because of the high costs and risks. Therefore, a national oil company can be a catalyst, stimulating exploration in new areas and developing new exploration, production, and transportation technologies.

Petro-Canada's main contention is that the social value of exploration in frontier areas exceeds its private value because these activities will eventually assist Canada to meet its energy goals faster than would have been the case under totally private development. This argument is based on the idea that private markets do not place a sufficiently high value on the social benefits derived from frontier exploration. The market failure is such as to require the Government to stimulate exploration because the true social value is relatively greater than the value perceived by private companies.

It is argued that while Petro-Canada unquestionably can be used to increase the pace of exploration in frontier areas, traditional fiscal instruments could also achieve the same objective. The implication of this argument is that Petro-Canada can perform this function, but it is not needed to achieve the end result. Since Petro-Canada's principal contribution is financial, many question the need to funnel investment funds from the Government through Petro-Canada to nonconventional projects. Other suitable means are available to the Canadian Government. The Government might just as easily--and less expensively--invest directly in nonconventional projects without creating a national oil company for this purpose. Such was the case before Petro-Canada was established; the Canadian Government had interests in Syncrude and the Polar Gas Project. As an alternative, the Government could develop additional financial incentives to be a catalyst to encourage private investment in these areas.

An advantage of Petro-Canada in this regard is that it is a direct means of Government intervention; the Government will have greater control over the extent and pace of exploration and development for this reason. Fiscal measures are indirect

and less precise in their impact on exploration and may have unintended side effects. In lieu of optimal fiscal and leasing policies that stimulate exploration in frontier areas, the flexibility of a national oil company such as Petro-Canada is beneficial in furthering the Canadian Government's goals in developing the country's nonconventional resources.

It can also be argued that Petro-Canada, while accelerating the pace of nonconventional resource development, does so in such a way as to save the Canadian taxpayer money. As noted earlier, Petro-Canada finances much of its nonconventional activities with the profits from its conventional activities. By so doing, the company shifts the cost from the taxpayer to the oil consumer. However, the capital to purchase Petro-Canada's profitable conventional operations from Atlantic Richfield Canada and Pacific Petroleum initially came from the Canadian taxpayer. Therefore, the Canadian public--as both taxpayer and consumer--is paying just as much, if not more, with Petro-Canada's form of nonconventional resource development funding.

The logic of this argument suggests that only when the profits generated by Petro-Canada's conventional operations and invested in nonconventional activities equals the cost to the taxpayer of the purchase of Arcan and Pacific Petroleum will the Canadian taxpayer break even. Up to this point, the tax dollars might just as well have been invested directly in nonconventional activities as in purchasing operations to generate comparable funds. Beyond this "break-even" point, the taxpayer benefits in that his initial cost is recouped and the oil consumer is now paying for the funds flowing from Petro-Canada's conventional to its nonconventional activities, financing future oil production.

Petro-Canada's role in other nonconventional resources development

As noted earlier, Petro-Canada is active in the Syncrude Project which produces oil from tar sands, and in research on heavy oil extraction. This is a major focus of the company's effort to speed development of such nonconventional resources. In these areas, Petro-Canada's contribution is like that made by private companies. The company's contribution is mainly financial, participating with others in these ventures. Unlike exploration in the frontier areas, private companies have been and are becoming increasingly interested in tar sands and heavy oil. There is no pressing need to stimulate investment in these activities because private companies consider them to be presently economical and profitable. The principal role for Petro-Canada in these projects is to ensure a substantial Canadian presence and to keep national energy goals in the forefront of policy consideration.

SUMMARY AND OBSERVATIONS

Summary

In general, our study indicates that Petro-Canada has made an important contribution to improving Canada's energy situation, and is likely to play an increasing role in this regard under the Canadian Government's new energy policy.

Petro-Canada's most significant contribution has been in the area of nonconventional resources. It has aided in accelerating development of tar sands and heavy oil production to decrease reliance on imported oil. The company has also successfully acted as a catalyst to spur frontier exploration and development. Another function which Petro-Canada has successfully performed is its "window on the industry" activities, providing the Federal Government with expertise and advice on the Canadian oil industry and general energy policy.

Likewise, it appears that Petro-Canada has been about as successful in conventional oil and gas production as private companies. There is no evidence that Petro-Canada is significantly less efficient than either Canada's private oil companies or subsidiaries of foreign-based companies.

A key area of uncertainty is Petro-Canada's role in bilateral oil importing agreements with other producing countries. While to date the Government has been successful in negotiating one such agreement--with Mexico--and is currently pursuing additional deals, the implications of these agreements for oil supply security cannot yet be determined.

In spite of the positive contributions of the national oil company to Canada's energy situation, these achievements might have been achieved with a more indirect approach such as that employed in the United States.

Observations

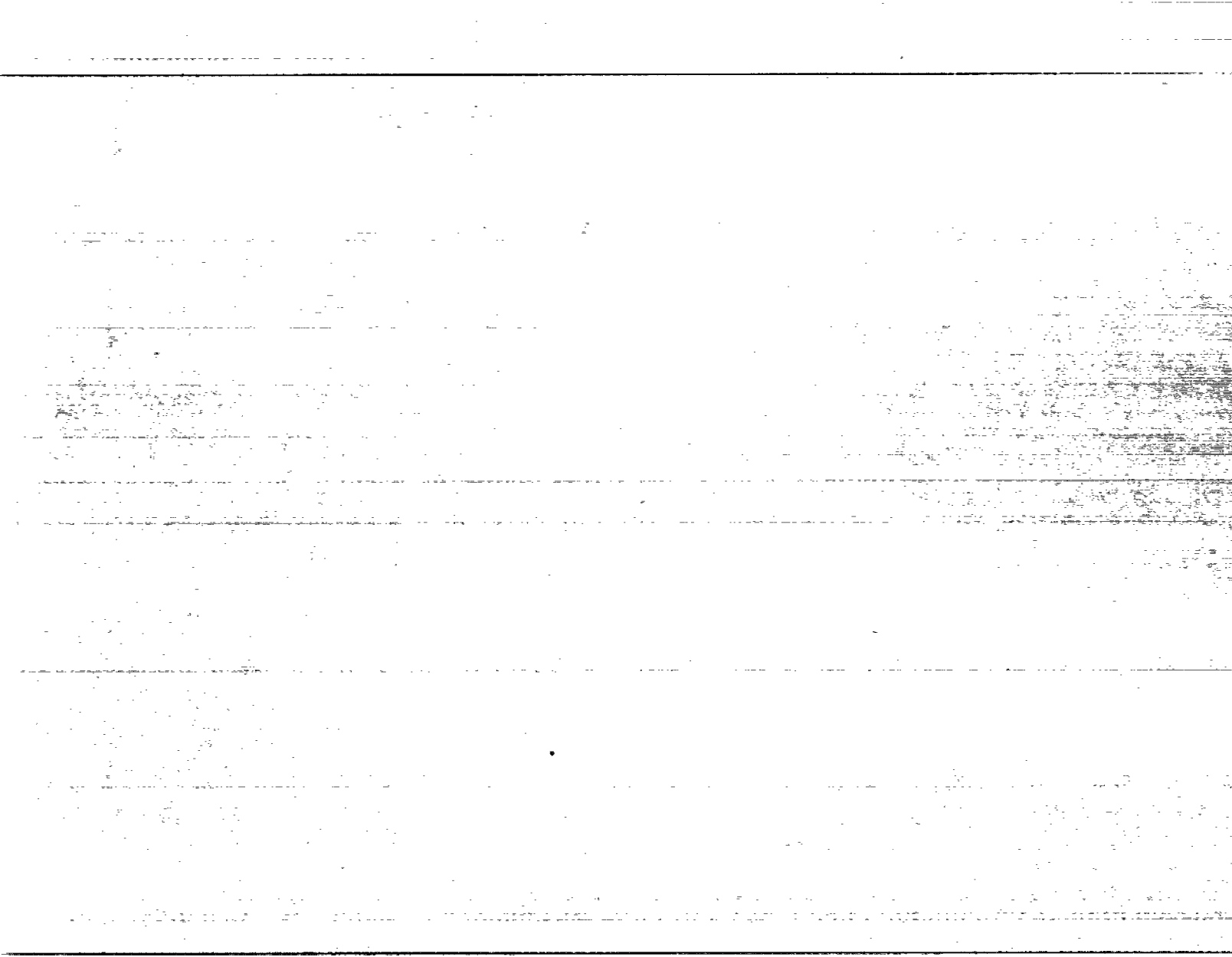
Based on our study of Petro-Canada and its role in Canada's energy policy, we have observed that:

- Petro-Canada's limited experience to date seems to indicate that a national oil company is not necessarily less efficient than private companies, as is often claimed. There is no evidence to suggest that Petro-Canada's conventional oil and gas operations are not comparable with those of private firms. However, there is no evidence that a national oil company provides net oil production.

- The concept of a national oil company acting as a "yardstick" of overall industry activity appears to have little validity. Both the case of Petro-Canada and independent economic analysis indicate that a national oil company is not well suited to perform such a function.
- Government involvement in bilateral oil importing agreements such as that between Canada and Mexico necessarily introduces political factors into the negotiating process which may have a bearing on the outcome and, thus, on security of supplies. Foreign policy and national security concerns will inevitably affect and be affected by government participation in such agreements. Whether this will enhance or diminish a consumer government's negotiating position, or ensure secure supplies, will vary according to participants and circumstances, and is therefore, indeterminate, as is the need for a national oil company to participate in the process.
- Petro-Canada's experience indicates that it is possible for a national oil company to accelerate the pace of exploration and development activities in high-risk/high-cost areas where private company activity may be insufficient and currently uneconomic. Petro-Canada has demonstrated that a government-owned company can act as such a catalyst.

In summary, the Petro-Canada experience indicates mixed results. For some functions it is either too early to determine or the evidence indicates that a national oil company is not particularly well suited. For others, notably the information function and the "social benefit" function, a national oil company may serve a useful purpose.

For both the information function and the "social benefit" function, the United States has chosen to pursue different means to achieve essentially the same objectives. The United States relies on information disclosure regulations and advisory groups such as the National Petroleum Council for information; it has chosen to promote the "social benefit" functions primarily by providing financial incentives to the industry through such mechanisms as the U.S. Synthetic Fuels Corporation. This study did not evaluate the comparative merits of the different approaches. Both would have to be viewed in the context of the economic systems and institutions of each country.



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