The National Energy Program

1980

Canada

The National Energy Program

1980

Energy, Mines and Resources Canada
Énergie, Mines et Ressources Canada

Report EP 80-4E

Published under the authority of
The Minister of Energy, Mines and Resources Canada

Copies are available on request from
Communications Branch,
Department of Energy, Mines and Resources
580 Booth St.,
Ottawa, Ontario K1A 0E4

Aussi disponible en français

Cat. No. M23-12/80-4E
ISBN 0-662-11136-2

CONTENTS

AN ENERGY PROGRAM FOR THE PEOPLE OF CANADA

This is a set of national decisions by the Government of Canada.

The decisions relate to energy. They will impinge, however, on almost every sphere of Canadian activity, on the fortunes of every Canadian, and on the economic and social structure of the nation for years to come. They have major, positive implications for the federation itself.

The Government of Canada is acting from what it perceives to be a position of national strength in energy, not weakness. We in Canada already produce more energy than we consume. We are less vulnerable than most other nations to the caprice of an international oil cartel, and we are better able than most to break that bond. Our energy options are wide enough to preclude any sudden rush to energy choices that may compromise our social and environmental goals. If we can restrain our demands through strong conservation efforts—and this we can do—we can keep these options open.

We have, moreover, a record of achievement. We are second to none—and in many respects we lead the world—in the techniques and the organization required for the exploration and development of primary energy resources. We in fact have a contribution to make to the world, especially the Third World, and we intend to make that contribution.

Matched against this present and potential strength, our energy problems are relatively small on the international scale.

Yet there are problems. The world oil situation threatens the economic growth and stability of the world, and Canada is profoundly affected. In such circumstances our strategy must be to use our domestic energy strength to both shield and stimulate our own economy.

Within the political structure of our own Confederation, our internal energy problems could be allowed through excessively prolonged debate to become divisive, disruptive and a cause of increased uncertainty at the very time when there is urgent need for decision, management, and unity.

We must not let our energy strength become a source of internal weakness. Most Canadians are aware of the strains created within the federation by domestic energy pricing and revenue-sharing issues. At the heart of these issues is fairness—how the benefits and burdens of the new energy situation are shared among Canadians.

Within the space of a year two national governments have attempted, in concert with the provinces, to reach agreement on oil and gas prices as part of a national scheme for the management of our energy future and the equitable distribution of benefits. On all sides the positions have been reasonable; yet consensus has not been possible.

The Governments of the Provinces, by word and action, recognize the need for decision. They share a determination to foster in all Canadians an early and vigorous response to the energy challenge. For the most part, they endorse the view that what is needed now is effective management of a manageable national energy situation; that decisive moves are mandatory.

Accepting its national responsibility in the energy area, the Government of Canada has therefore decided that it must act now, and that it must act in a manner that fully recognizes the special circumstances surrounding energy.

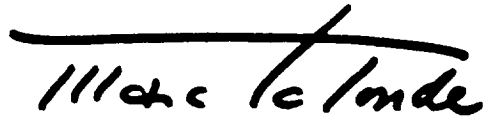
Such considerations have dictated the three precepts of federal action:

- It must establish the basis for Canadians to seize control of their own energy future through *security* of supply and ultimate independence from the world oil market.

- It must offer to Canadians, all Canadians, the real *opportunity* to participate in the energy industry in general and the petroleum industry in particular, and to share in the benefits of industry expansion.

- It must establish a petroleum pricing and revenue-sharing regime that recognizes the requirement of *fairness* to all Canadians no matter where they live.

The Government intends to achieve these objectives through the National Energy Program outlined in this document. It believes this Program to be eminently in the national interest.



MARC LALONDE
Minister
Energy, Mines and Resources Canada

THE PROBLEMS

The International Context

The world energy problem is a problem of oil availability and price. Over the past two decades the world tripled its consumption of oil. The relative use of oil doubled from one-fifth to two-fifths of primary energy demand. This growth, coupled with a decline in the capacity of the United States to supply its own oil needs, has placed a heavy burden on world oil markets.

By the mid-1970s the large multi-national oil companies had lost their dominance over world oil production, and a new force emerged: the Organization of Petroleum Exporting Countries (OPEC), a cartel formed to obtain higher returns for its oil through supply management and decree. The cartel has succeeded. Oil prices that were $3 a barrel in 1960—and still about $3 a barrel in 1970—are now $38 or more. In addition, the traditional marketing and supply roles of the major oil companies are being substantially reduced by state-to-state deals between OPEC members and consuming countries. The seven major international oil companies, which handled 64 per cent of non-Communist oil production in 1973 and 1974, accounted for only 46 per cent of production in 1979.

Two-thirds of OPEC production is in the Middle East, controlled by members of the Organization of Arab Petroleum Exporting Countries (OAPEC) and Iran. Some of these countries have made clear their intention not only to get maximum prices for their oil, but to use oil as a broad political and economic weapon.

OPEC's effectiveness was proved by events after the 1978 Iranian revolution. There was more than enough oil available in the months following the revolution to meet the world's needs. Yet the price of world oil more than doubled, due to OPEC's determination to raise prices—even if it meant restrained production, and panic buying by consumers fearing real shortages. Today OPEC is more strongly than ever in control of the world oil market. Moderate members of the organization—especially Saudi Arabia—have attempted to restrain the march of prices, but with limited success thus far.

It was once thought that OPEC's power to set prices could be eroded significantly by consuming countries reducing their oil demands. While this is clearly the long-term solution, and while slackened demand may moderate for a time the pace of price increases, the prospects are for a continuation of control by OPEC. Its members have demonstrated an ability and a willingness to adjust supplies in order to raise prices. In this vital sense, the oil market is not a free market. A market is not free if producers are able to manipulate prices by manipulating production.

Far from producing market stability, domination of oil supply by a few large producers has had the opposite effect. Customers are often willing to pay

high prices, or accept extraordinary purchase terms, for fear that OPEC countries will use their power to reduce supplies to them, or that political instability in the region will result in erratic production. The oil market has proved to be highly unstable and highly sensitive to political events.

After the first OPEC interventions in the mid-1970s, the primary concern of the industrialized world was continuity of *supply*. The possibility of supply interruptions remains very real. The Iran-Iraq war has demonstrated once again the volatility of the Middle East region, upon which the world depends heavily for oil supplies. Consuming countries must make provision for emergencies arising from embargoes, military or political upheaval in the producing countries, or major technical failures. Experience has shown, however, that the crucial issue is the *price* that consuming countries must pay to obtain oil; the fundamental problem is the effect of rapidly rising oil prices on the economies of the consuming nations.

In short, the world is experiencing a major economic crisis brought on by decisions on the part of a small group of producing countries to raise the price of oil. The world has weathered each oil supply crisis, including the upheavals in Iran. But the economies of the industrialized world—including

OPEC and the World Oil Market

"Members of OPEC have seized three vital areas of control:

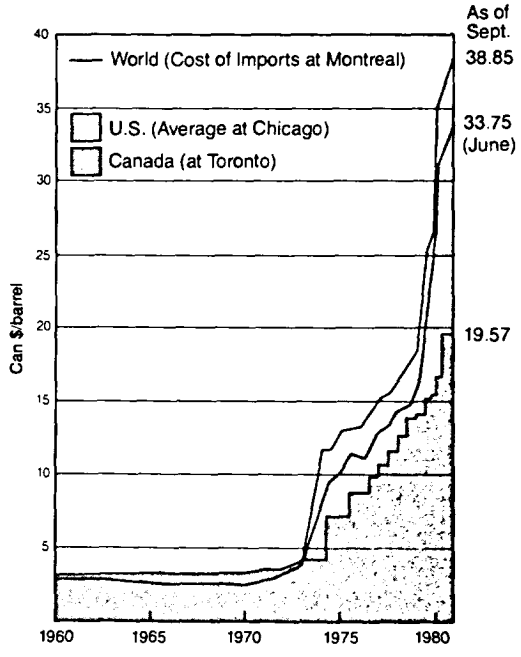
- Control over pricing, as OPEC first asserted a right to bargain with major oil companies then—as the boom of 1972-73 pushed demand up to the levels of existing oil production capacity—the right to set the price unilaterally.

- Control over production levels, as OPEC countries first refused, in 1973's aftermath, to expand capacity to the levels the oil companies had earlier planned; then took complete control of production levels in 1979, planning reductions in output for 1980.

- Control over the physical oil distribution system, again in two stages. After 1974, OPEC countries nationalised the oil production facilities and replaced oil company control with a framework of medium-term lifting agreements, mostly with oil majors. After 1978-79, producer governments began to replace these arrangements with much more detailed and restrictive contracts, with a wider range of would-be purchasers."

—from *The Economist*, 29/12/79

Crude Oil Prices: World, United States, Canada



Canada's—have been shocked, to the point where their growth momentum of the pre-1975 decade has been halted, and in some cases reversed.

The outlook for the next decade is not encouraging. The International Energy Agency's forecast of oil supply and demand indicates "shortfalls" in 1985 and 1990, despite what may be optimistic expectations of production from some key countries, notably Saudi Arabia and Iran. The IEA forecast also assumes oil demand growth rates that are modest by historical standards, and which could—without strong conservation efforts—be exceeded under more reasonable economic growth conditions than have prevailed since the mid-1970s.

These projected physical shortfalls are, of course, notional. There may be short-term shortages, during which emergency storage and sharing arrangements will have to be deployed. But the market—however imperfect—will force supply and demand into balance given time. The real issue is: at what cost to the

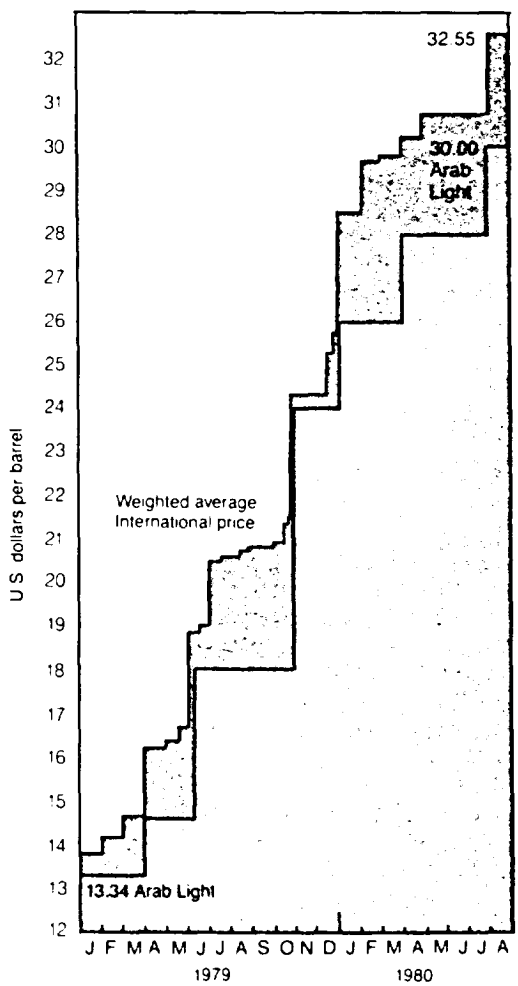
Does OPEC Control Assure Orderly Prices?

Although international prices are well above the levels considered necessary to bring on sufficient supplies of Canadian oil, it has been argued that Canada's prices should be firmly linked to some arbitrary fraction, say 75 or 85%, of international oil prices. While such a formula would keep prices in Canada below international levels, consumers would continue to remain seriously exposed to the instability of international oil markets.

The existence of OPEC and its ability to control supplies has not led to an orderly market reflecting changes in international demand. Instead, the market has been chaotic. In particular, events that have occurred since the end of 1978 has demonstrated the inability of Saudi Arabia, OPEC's largest oil producer, to act as a stabilizing influence in times of crises.

The chart illustrates this period of instability, comparing the Saudi Arabian benchmark light crude oil price to the weighted-average price of internationally traded oil. When political instability affected spot market prices during this period, OPEC price "hawks" (Iran, Libya, Algeria and Nigeria) were quick to increase the official price of their oil relative to Saudi Arabian marker crude. Pricing "moderates" within OPEC attempted to restrain escalating prices but eventually increased their own prices to narrow OPEC price differentials.

World Price of Oil, 1979-80



consuming countries? The oil cartel has demonstrated its capacity to raise prices almost at will, even when production capacity exceeds demand. What then might be expected as the balance worsens along the lines of the IEA forecast? What if a major supply source is affected, as Iran and Iraq are now? What other economic or political elements might be brought into the oil market?

Recognizing the harsh economic consequences of oil prices suggested by these forecasts, the industrialized countries are accelerating their efforts to reduce their dependence on imported oil.

For many consuming countries, the transition to a more efficient, sustainable and secure energy structure will be lengthy and difficult. Most countries face agonizing, costly and controversial choices such as heavy reliance on coal or nuclear power, options coloured by environmental, safety and health concerns. Renewable forms of energy, though promising, are not yet sufficiently developed to take up the slack. Conservation efforts are proceeding, but major reductions in consumption will take time, as behaviour patterns and industrial structures, premised on cheap energy, are modified.

Excerpts From the Economic Summit Communique (Venice: June, 1980)

"In this, our first meeting of the 1980s, the economic issues that have dominated our thoughts are the price and supply of energy and the implications for inflation and the level of economic activity in our own countries and for the world as a whole. Unless we can deal with the problems of energy, we cannot cope with other problems.

Successive large increases in the price of oil, bearing no relation to market conditions and culminating in the recent decisions by some members of the Organization of Petroleum Exporting Countries (OPEC) at Algiers, have produced the reality of even higher inflation and the imminent threat of severe recession and unemployment in the industrialized countries. At the same time they have undermined and in some cases virtually destroyed the prospects for growth in the developing countries.

We must break the existing link between economic growth and consumption of oil, and we mean to do so in this decade. This strategy requires conserving oil and substantially increasing production and use of alternative energy sources.

We must rely on fuels other than oil to meet the energy needs of future economic growth. This will require early, resolute, and wide ranging actions. Our potential to increase the supply and use of energy sources other than oil over the next ten years is estimated at the equivalent of 15–20 MMb/d of oil. We intend to make a coordinated and vigorous effort to realize this potential. To this end:

- We will increase efforts, including fiscal incentives where necessary, to accelerate the substitution of oil in industry.
- We will encourage oil saving investments in residential and commercial buildings, where necessary by financial incentives and by establishing insulation standards.
- In transportation, our objective is the introduction of increasingly fuel efficient vehicles. The demand of consumers and competition among manufacturers are already leading in this direction. We will accelerate this process.
- We are deeply concerned about the impact of the oil price increases on the developing countries that have to import oil. The increase in oil prices in the last two years has more than doubled the oil bill of these countries, which now amounts to over $50 billion. This will drive them into ever-increasing indebtedness, and put at risk the whole basis of their economic growth and social progress, unless something can be done to help them. A major international effort to help these countries increase their energy production is required."

Clearly, the world economy faces a decade of traumatic adjustment and transformation, supply uncertainties, and unpredictable world oil prices. This means low rates of economic growth and persistent inflation, as the world economy adjusts to successive price shocks.

Clearly, too, any country able to dissociate itself from the world oil market of the 1980s should do so, and quickly. Canada is one of the few that can.

What Is The International Energy Agency?

The International Energy Agency (IEA) was established in 1974 following the Arab oil embargo. Twenty-one countries* have adhered to the Agreement on an International Energy Program, which created the IEA within the context of the Organization for Economic Co-operation and Development. The basic objectives of the IEA are to:

- Promote secure oil supplies on reasonable and equitable terms;
- Take common effective measures to meet oil supply emergencies;
- Play a more active role in relation to the oil industry;
- Reduce the dependence of members on imported oil by undertaking long-term co-operative efforts;
- Promote co-operative relations with oil-producing countries and with other oil-consuming countries, including those of the developing world.

*Participating countries are Australia, Austria, Belgium, Canada, Denmark, West Germany, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom and the United States.

The policy body of the IEA is the Governing Board, which meets regularly at the official level, and at the Ministerial level at least annually. The IEA plays a useful role not only as a spur to efforts by member countries, but as a clearinghouse and centre for analysis of the international energy situation and outlook, and measures to improve it.

IEA Projection: Potential World Oil Supply and Demand (1979-90)*

	1979	*1985*	*1990*
	(MMb/d)		
World Demand			
IEA/OECD	41.4	44.3	45.1
Other	10.2	14.6	19.2
Total	51.6	58.9	64.3
World Production			
Non-OPEC	20.1	25.6	28.1
OPEC	31.6	30.8	31.6
Communist countries	1.1	0.4	-1.1
Total	52.8	56.8	58.6
Stockbuild/(Shortfall)	1.2	(2.1)	(5.7)

*IEA projection as of May 1980.

Towards Canadian Energy Independence

Canada's position in this unsettled, traumatized energy world is unusual. Unlike most of its industrial partners, Canada is a *net exporter* of energy. In no sense, however, does this insulate Canada from the new energy concerns affecting the rest of the world, because Canada has the same weakness—albeit on a smaller scale—as most other industrial countries: dependence on imported oil. Some 425,000 barrels a day (about 215,000 barrels a day on a net basis), or about 25 per cent of Canadian oil consumption, is now

imported. Under previous policies, this dependence was expected to grow to over 600,000 barrels a day by the mid-1980s—at the same time as our exports of natural gas, electricity, and coal would be rising.

Such a pattern made economic sense at one time, but not now. Growing dependence on imports of oil is unnecessary and unwise. It exposes us to economic and political pressures that we need not endure. It makes Canadians doubt their energy future, when—in reality—energy is one of our great strengths.

For some years, Canada has had the technical ability to become self-sufficient in energy, principally by using in the domestic market more of the fuels we now export.

Canada produces more than enough energy to displace all of our oil imports, and still have substantial quantities of energy available for export if desired. We have significant excess capacity in the natural gas and electricity production system, and considerable potential in coal and renewable energy. With determined efforts to restrain energy demands, giving us time to develop new energy sources, our self-sufficiency capacity could last for the foreseeable future. Recent large additions to the domestic supply of natural gas now provide a further basis for a concerted effort to substitute domestic fuels for foreign energy. The dramatic rise in oil prices since the mid-1970s, and the potential costs of reliance on insecure supplies of imported oil, establish a powerful

Canadian Trade Balances in Energy Commodities

					Uranium		
Year	*Petroleum**	*Natural Gas*	*Coal & Coke*	*Electricity*	*Ores etc.*	*Elements & Isotopes, etc.†*	*Total Net Exports*
				($ millions)			
1966	−105	91	−144	6	36	2	−115
1970	129	201	−135	22	26	−60	183
1971	172	244	−83	37	18	−5	383
1972	344	299	−90	59	40	15	667
1973	647	343	−9	103	64	5	1,153
1974	1,045	488	−84	170	51	33	1,702
1975	171	1,084	−160	91	51	70	1,307
1976	−624	1,607	−13	153	67	174	1,364
1977	−1,065	2,028	−66	362	75	133	1,467
1978	−1,199	2,190	−8	477	207	439	2,106
1979	−557	2,889	−184	728	379	590	3,844

SOURCE: Statistics Canada, *Exports—Merchandise Trade*, Annual, Cat. 65-202, and *Imports—Merchandise Trade*, Annual Cat. 65-203.

*Includes liquefied petroleum gases (net export of $525 million in 1979). Also includes several non-energy petroleum products. In 1979 imports of these products amounted to $153 million while exports totalled $21 million, for a net import of $132 million.

†This category includes items with both energy and non-energy uses. Unfortunately, no more detailed breakout is available that would permit a more precise estimate of trade in purely "energy" commodities produced by the nuclear industry.

economic and political rationale to reduce oil's share of our energy market. The way is now clear to reduce oil imports through use of more plentiful domestic energy, which is reasonably priced, readily transportable, and environmentally acceptable.

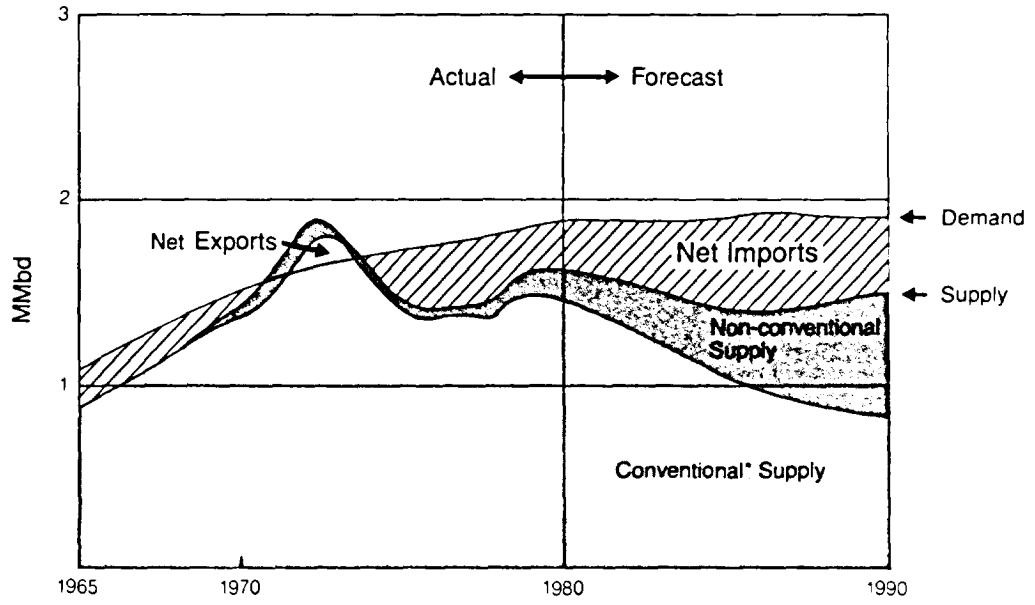
This is the key distinction between Canada's energy position and that of its major industrial partners. Canada's energy problem is not only manageable, but its solution can draw from many options. Canada has the diversified energy resource base to support a relatively quick and clean shift away from world oil. Canada also has the time to make the transition to an economy that is more efficient in its use of energy, and more dependent upon renewable energy sources.

Canada's capacity in electricity (including projects under way or planned) has more than kept pace with our demand for electricity. This extra margin of capacity gives us time to analyze further the choices we will have to make on the use of electricity, and in particular on the role of nuclear power in the generation of that electricity.

Canada has a strong nuclear industry, and one of the world's safest and most efficient nuclear power systems. Nuclear power plays a modest but helpful role in providing reasonably-priced electric power to Canadians.

Some Canadians are concerned about the use of nuclear power. Others have reservations about the export of nuclear technology. At the same time, there is a concern that Canada not allow one of its most successful, high technology industries—and one of its indigenous energy options—to wither away.

Canadian Oil Supply and Demand: Continuation of Current Policy



*Includes enhanced recovery and pentanes plus.

Some provincial governments have studied this issue, and provided helpful input to the public debate. The Government of Canada has launched an intensive internal review of its own policies and programs, and will report the results as soon as possible.

Canada does not have to rush headlong into new large-scale electrical generation alternatives. If we make the right decisions today about all of our energy opportunities, we can move quickly off world oil, while still giving ourselves the time to analyze with some care issues such as the technology needed to ensure the safe disposal of nuclear wastes, and the longer-term benefits and costs of the nuclear fuel cycle. If we act now, we will give ourselves the time to consider carefully our energy path beyond the 1980s.

For this reason the National Energy Program acts decisively in those areas where we can wait no longer. It does not deal extensively with issues concerning the generation of electricity. These will be dealt with when the Government's nuclear power review is completed.

Nor is the role of coal in Canada's energy system dealt with in great detail in this document. In many respects, coal provides Canada with a further measure of energy security. Canada has more coal than its own immediate future needs will require. High transportation costs may, however, dictate a continuation of the current pattern of simultaneously importing and exporting coal. Nevertheless, coal represents a developmental opportunity in Canada, and choices will have to be made as to how to best exploit this resource base. To foster the process, the Government of Canada has recently published a *Discussion Paper on Coal*. It encourages public discussion of the development alternatives for this important resource.

Energy Benefits and Burdens

While energy security is within Canada's grasp, this by no means solves the economic problem caused by the world energy situation. Indeed, Canada's economic problems could be worsened by a single-minded effort to solve only the oil supply-demand balance problem, especially if we were to rely only on dramatically higher energy prices to solve this problem. Moreover, the economic problem spills over into basic and difficult issues such as the nature of the Canadian federation.

As a net exporter of energy, Canada as a trading nation gains from increases in world oil prices; as those prices rise, so does the value of our energy exports, which exceeds our cost of imported oil.

However, this is the only bright part of the story. Canada, as part of the world economy, suffers when its trading partners are hit by major energy price increases. Indeed, our vulnerability to economic shocks is greater than that of many other industrialized countries, because foreign trade makes up such a large proportion of our national income. Moreover, the impact on Canada's economy is not borne equally by all parts of Canada: the petroleum-producing areas benefit from OPEC actions, while the rest of Canada is penalized. For

example, a recent Department of Finance study* concluded that rates of return in Canada's manufacturing industries had been cut in half by 1978, as a consequence of the increases in the real price of oil that had occurred in the 1970s. The Government of Canada has the responsibility to help the national economy adjust to OPEC's shocks, and to see that the benefits and burdens are fairly distributed.

Energy has always been a special case. No Canadian can escape the impact of changes in its availability or price. Its influence on other activity—other products, other services—is pervasive. Reliance upon it is enormous. None of us can eliminate this reliance. Governments in Canada and elsewhere have long recognized and responded to this uniqueness. In Canada, for example, trade in the major forms of energy has been closely regulated by federal agencies for many years. Special procedures governing energy exports have been in place for some time, reflecting a national consensus that Canadian needs are to be served first, and that only surplus energy may be exported. At the international level, creation of institutions such as the International Energy Agency reflects a view that energy's role in today's world is extraordinarily important.

And now a new reason for special treatment has emerged. Due to external events, which bear no relationship to the Canadian energy situation, Canadian consumers are asked to pay ever-rising prices for both imported and domestic energy. A large proportion—approaching one-half—of the revenue from these higher domestic prices accrues to the governments of the petroleum-producing provinces; most of it to Alberta. The resulting inter-regional transfers

**Rate of Return and Investment Profitability*, Department of Finance, April 1980.

How Higher Energy Prices Affect Incomes and Economic Growth

Rising world oil and energy prices have two immediate macro-economic effects in the industrialized energy-importing countries. First, inflation is exacerbated through both direct and indirect price shocks. Second, having to spend more on energy, consumers have less income to spend on other goods and services. This lowers aggregate demand in the economy and results in lower economic growth and increased unemployment. Higher energy prices also have long-term impacts. Unless offset by accelerated technological change or increased investment, an oil price increase will also lower the long-run growth potential of the economy.

Following the 1973-74 OPEC oil price increases, the rate of *economic growth* and *employment* in industrialized countries fell dramatically. The 1979-80 round of OPEC increases has produced a similar effect. Inflation has increased in all of the major industrial energy-importing countries and all are experiencing a significant economic slowdown. The long-term effect of such price shocks depends upon the social and economic structure of the country involved. Through sustained export drives, significant employment reductions, and strong income policies, West Germany and Japan have been able to restore price stability relatively quickly. They have not, however, successfully offset the impact on economic growth. Most other nations have been much less successful. For them, oil price shocks have tended to result in a continuous ratcheting up of their inflation rate.

of wealth are now so large, and growing so rapidly, that they have become a national issue.

The national and provincial governments in Canada have specific rights, powers, and obligations under the provisions of the *British North America Act*. However, there is no legislatively-defined arrangement under this Act for the sharing of revenues arising from the exploitation of natural

The Present Structure of Resource Taxation

Under the *Income Tax Act*, special rules have been established for income and investments in the resource sector.

A resource company pays the standard federal corporate tax rate of 36%, and a provincial corporate tax rate that varies from 11 to 15%, depending on the province. In addition, the industry pays production royalties to provinces or, in the case of lands under federal jurisdiction, the federal government.

For the purposes of federal income tax, resource income, after operating costs and capital cost allowance, is reduced by a 25% Resource Allowance, a provision which recognizes the fact that royalties paid to governments are not deductible for income tax purposes. The income on which tax is to be paid can be further reduced by a number of deductions, the most important of which are:

- Exploration costs, written off at a 100% rate (i.e. written off completely in the year incurred);
- Development expenditures, written off at a 30% rate; and
- Land bonus payments, written off at a 10% rate.

Resource firms can deduct a *further* one-third of exploration costs, most development costs, and certain capital equipment costs; and one-half of the costs of enhanced recovery equipment, by virtue of the *earned depletion* allowance. This deduction can only be claimed against resource income, with a general limit of 25% of that income. However, for specific enhanced recovery equipment and oil sands mines, the ceiling on the allowance is 50% of *all* income.

These deductions provide a powerful incentive to re-invest, for firms that are in a tax paying position. By investing, the firm reduces its corporate income taxes. As a result, the effective cost of investment to such firms is reduced: the firm's cash cost is its investment minus its tax savings.

For a firm located in Alberta and able to make full use of these deductions, the after-tax cost of an exploration program is only 37% of the investment undertaken. Sixty-three per cent of the cost is effectively borne by Canadian taxpayers.

The investment incentives in the federal tax system have significantly reduced the effective rate of taxation for most firms, and thus have reduced the federal government's share of resource revenues. Despite a nominal federal tax rate of 36%, the effective rate since 1974 has been about 10%, less than one-third of the nominal rate. The federal government has provided the greatest share of the incentives to the industry, while—largely as a result of these incentives—receiving the smallest share of the revenue.

Federal investment incentives in the income tax system also affect provincial income from corporate taxes, but this is a relatively minor source of provincial government revenue from oil and gas production. Some provinces provide for the effective deductibility of royalties in calculating provincial income taxes. These and other provincial incentive schemes have been modest, in comparison with the federal contribution, but add to the attractiveness of reinvestment in the province in question. In most provinces firms may deduct against royalties expenditures on specified programs. The result of the combined federal and provincial incentives can be very low, or even negative, after-tax costs.

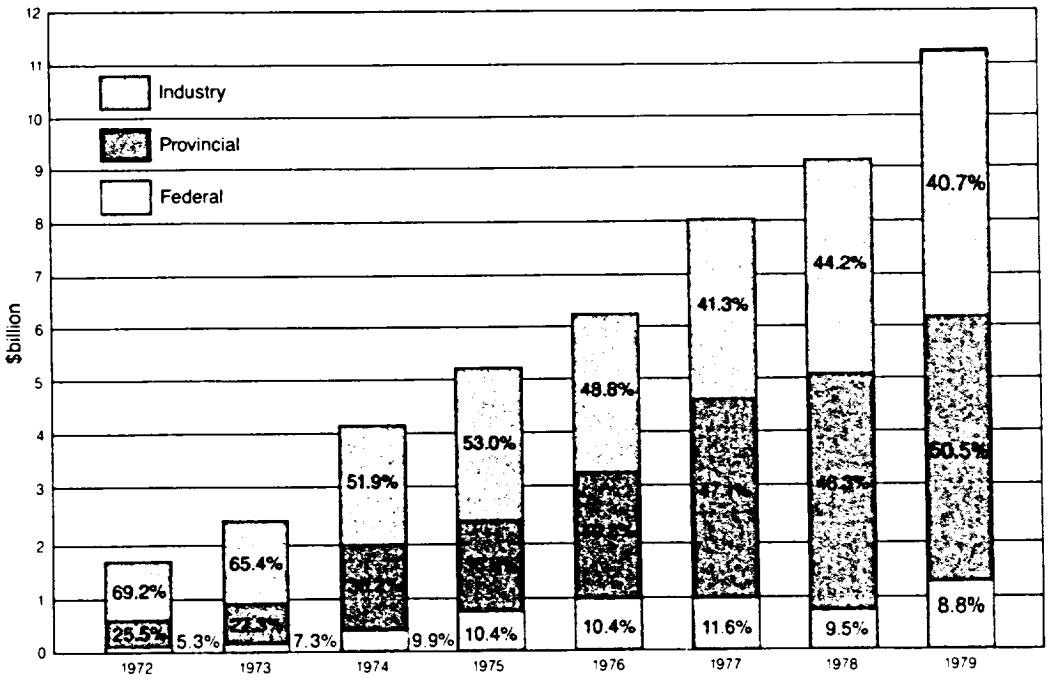
The re-investment incentives offered by the provinces have not cut into provincial revenues to the same degree as the federal incentives have eroded the federal tax base. Taking into account land bonus payments, the provincial share of oil and gas revenues has increased from 38% in 1974 to 48% in 1979.

resources, including petroleum. The revenue share accruing to each level of government is a function of a mixture of fiscal instruments that has evolved over time. The result is a distribution of benefits that is extraordinarily unfavourable to the national government, even in comparison to a country such as Australia, where the state governments, like Canadian provinces, own the resources. Revenue-sharing arrangements in Canada are an international anomaly, bearing no relationship to the rights and responsibilities of the two levels of government.

The producing provinces are entitled to substantial revenues by virtue of their ownership of resources. The revenues accruing from the sale of oil and gas, and the economic benefits of the resource boom now under way, have created an unprecedented, and welcome, prosperity in the three westernmost provinces. This prosperity has no discernible end; indeed, the energy surge is bringing about a major, enduring westward shift of wealth, activity and population.

At the same time, there must be recognition of a national claim—a claim by all Canadians—to a share in these revenues and benefits. The petroleum industry's growth over the years, and its buoyant outlook, owes much to national policies, including those that provided assured markets for western Canadian oil and gas, and those which gave, and still give, extraordinarily generous incentives under the federal *Income Tax Act*. The citizens of Canada,

Historical Sharing of Oil and Gas Production Income



and their national government, have played a major role in fostering the development of the oil and gas industry, and deserve to share in its benefits.

Moreover, aside from this national patrimony entitlement, the Government of Canada has a legitimate claim to a share of the energy industry's revenues, to support its energy initiatives, and its broad economic management responsibilities—to cushion individual Canadians from the adverse economic effects, to facilitate industrial adjustment, and to see that fair play is done. As already noted, OPEC price rises provide a windfall to Canadian energy producers; they also hit hard at the economy, driving inflation rates up, and growth and employment down.

While Canadian economic performance since the initial OPEC price shock compares favourably with that of other industrial countries, the effort to support the economy has left the national government's fiscal position badly weakened. Each OPEC price shock makes the federal position worse.

This is a crucial difference between Canada and most other energy-rich countries, among them federal states like Australia, or unitary states such as Norway and the United Kingdom. In these countries, the national government obtains most of the revenues accruing from the increase in price of domestic petroleum; it captures the "upside" appreciation; it gets the financial wherewithal to offset the negative economic consequences of world oil price shocks. In Canada, one provincial government—not all, and not the national government—enjoys most of the windfall, under current policies. These policies are no longer compatible with the national interest. The Government of Canada must have a reasonable share of revenues from oil and gas production, if it is to shield Canadians from the full impact of the negative economic shock, and help bring about the adjustments that must be made in Canada's economic, energy, and industrial structure.

Land Bonus and Rental Payments

	1970	*1972*	*1974*	*1976*	*1977*	*1978*	*1979*	*Total, 1970s*
	($ millions)							
Alberta	116.6	124.4	157.3	255.5	679.9	740.5	1,144.7	3,697.0 (77%)
Saskatchewan	12.3	12.8	14.0	20.3	25.8	52.7	53.6	227.7 (5%)
British Columbia	25.5	30.0	36.8	59.0	142.2	194.6	213.2	790.0 (16%)
Other Provinces	2.7	2.8	2.6	4.5	6.9	16.6	7.2	51.1 (1%)
Federal Government	7.1	7.0	6.3	4.7	5.3	8.0	7.8	64.8 (1%)
Total	164.2	177.0	217.0	344.0	860.1	1,012.4	1,426.5	4,839.0(100%)

Land bonus payments are made by oil and gas companies for the right to explore for and develop resources on specific tracts of land. The payments are made to provincial governments for the rights on lands within provincial boundaries and to the federal government for Canada Lands. Rising land bonus payments are a good indication that the industry sees attractive exploration opportunities and has sufficient cash flow to bid aggressively for land. Since the mid-1970s, the industry's cash flow has been based upon oil price increases which averaged about $2 a year. Clearly, the main beneficiaries of increased land payments are provincial governments.

The revenue-sharing issue that has arisen in the wake of rapid oil and gas price rises is not primarily one of certain Canadians becoming richer, and others poorer. Nor should it be a matter of dispute between westerners and easterners, or Albertans and other Canadians. There have been, and probably will be again, substantial disparities in wealth between the various regions of Canada. In the past, one of the results of such disparities has been migration to the more prosperous areas. This natural phenomenon will continue, and the population of Alberta will increase substantially over the next decade.

Nor is the issue primarily one of the sharing of revenues between government and industry. While there is some scope to obtain increased revenues from the oil and gas companies, the solution cannot be found exclusively in this direction. To rely entirely on new taxes upon the industry would be unfair. It would also be ill-advised, for it would put in jeopardy our energy supply objectives. Finally, it would miss the basic point: *what is the appropriate distribution of oil and gas revenues among governments?*

What share of revenues reflects the needs and responsibilities of the two levels of government? At present, provincial governments receive more than three-quarters of the oil and gas production revenues accruing to governments. Alberta, with 10 per cent of Canada's population, receives over 80 per cent of the petroleum revenues gained by provinces.

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

Alberta's Oil and Gas Resources—Rapidly Depleting?

In total, Alberta's *remaining established reserves* of oil and gas were *larger* in 1979 than in 1970, despite the production of huge quantities of oil and gas during the decade. What *has* changed is the mix; reserves of conventional crude oil and equivalent have declined, while natural gas reserves and oil sands resources committed to operating plants have increased.

The oil sands reserves in the table are those dedicated to the existing Suncor and Syncrude plants only. Total oil sands reserves are far greater. The Alberta Energy Resources Conservation Board (AERCB) estimates established surface-mineable oil sands reserves to be about 25 billion barrels from the Athabasca deposit alone. Total non-conventional petroleum reserves in Alberta are far higher again.

For natural gas, the table below reflects an increase in remaining recoverable reserves from 48 trillion cubic feet in 1970 to about 61 trillion cubic feet in 1979.

*Alberta Oil and Gas Reserves**

	1970	*1979*
Total remaining established reserves (billions of barrels of oil equivalent)	18.5	18.7
Relative shares		
Conventional crude oil and equivalent	53%	36%
Natural gas	45%	56%
Oil sands	2%	8%

*Based on estimates by the Alberta Energy Resources Conservation Board.

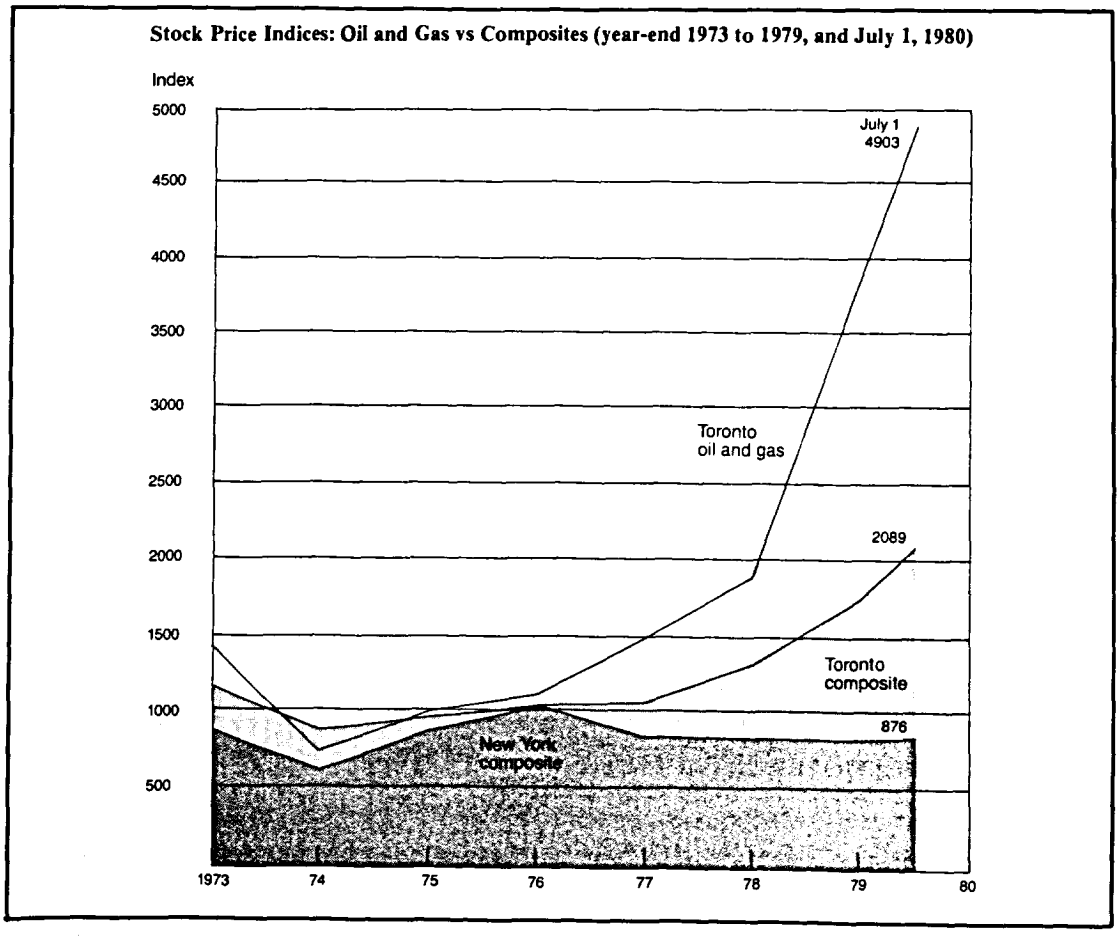
Government of Alberta to have growing budgetary surpluses for the foreseeable future.

Under any plausible price and revenue-sharing system, the financial position of the Alberta government will improve substantially, in both absolute and per capita terms. Canadians must decide, however, whether the current arrangements, which concentrate the financial benefits of higher oil prices in one provincial government, and give little benefit to the national government, are appropriate.

The Government of Canada believes that the present system is inappropriate and unfair. It believes that more appropriate arrangements must be made, so that the national government, which is accountable to all Canadians, gains access to the funds it needs to support its response to national needs.

Canadian Ownership

A major objective of national policy over the years has been to foster a strong petroleum industry, through pricing and tax incentives more generous than those available outside the resource sector. Until recently the dominant



motive for this Government of Canada policy was *not* the security of our oil supply, because up to the mid-1970s overseas oil was not only cheaper than domestic oil, but was also considered secure. The most important reason for developing these national policies was a determination to promote the domestic oil industry, and encourage economic growth in Western Canada, even though it meant imposing higher direct costs on other parts of the country, and left the Government of Canada with little income tax revenue from the petroleum industry.

These policies have succeeded. The petroleum industry enjoys unprecedented prosperity and growth. No other industrial sector in Canada can match its vitality and outlook.

The financial facts are striking. Net oil and gas production revenues in Canada have risen from $1.2 billion in 1970 to $11.1 billion in 1979.

Since the *volume* of domestic oil and gas production has increased by only about 30 per cent since 1970, it is clear that the dramatic improvement in the health of the producing industry is attributable mainly to large *price* increases, which have provided the industry with large profits from production, and with an appreciation in the capital value of its established reserves—reserves discovered before the first OPEC price increases. The effect of these price increases is a massive transfer of wealth, now and in the future, from consumers to producers. Most of these producers are foreign owned; the wealth transfer is therefore away from Canadians.

One of the objectives of the *Energy Strategy for Canada,* published by the Government of Canada in 1976, was to increase substantially Canadian ownership of the petroleum sector. While there has been some reduction in the level of foreign ownership of the industry, the objectives have not been met. Perhaps due to a pre-occupation with oil security objectives since the mid-1970s, the set of energy policy instruments has not been sufficiently conducive to increased Canadian ownership of the sector.

In general, price and tax policies have provided the industry with the cash flow necessary to finance its expenditures. This means that the oil consumer and the Canadian taxpayer have financed virtually all of the substantial expansion of this industry.

Concern is often expressed over Canada's need for foreign capital in the energy sector. Such a need is often cited as the basis for accepting the large degree of foreign ownership that exists in the oil and gas industry. Yet, the oil and gas industry, far from drawing in foreign capital, has—since the 1974 oil crisis—been a capital exporter. The industry, in addition to maintaining its normal dividend and interest payments, supported net capital outflows abroad of $2.1 billion in 1975-79. Some of these funds represented a return of capital to foreign owners; others represented new foreign investments by Canadian companies. If dividends and interest payments are added to this total, the total outflow over the period 1975-79 becomes approximately $3.7 billion. Dividends rose from $200 million a year in 1973 to $600 million in 1979. In addition, the foreign parents have received fees for technological, operating and managerial services.

Moreover, the prospect is for these capital exports to grow. The continued increase in oil and gas prices that will occur means a further large foreign wealth transfer from Canadians to foreign shareholders. By ignoring the problem of foreign ownership in the past, Canadians have lost a significant share of the benefits of having a strong resource base. If we fail to act now, Canadians will lose once again.

Financial Situation of the Petroleum Industry

Under the provisions of the *Petroleum Corporations Monitoring Act*, the Department of Energy, Mines and Resources obtains detailed information about the petroleum industry's sources and uses of funds. Some highlights of the report by the Department on the monitoring survey for 1979 are as follows:

- Internal *cash flow* in the industry rose in 1979 to more than $7 billion, a gain over 1978 of 43.6%.
- *Total funds available* to the industry in 1979 rose to almost $12 billion.
- *After-tax profits* in the industry reached $4.7 billion, an increase of 53.8% from the 1978 level.
- Total *capital expenditures* by the petroleum industry in Canada increased last year by 23.3% to $5.8 billion, but petroleum-related expenditures as a share of total funds available dropped to 45.1% from 55.6% in 1978.
- Diversification of petroleum companies into *other energy* activities slowed in 1979, with total investments in coal and uranium declining to $66 million from $115 million a year earlier.
- Additional funds earmarked for working capital purposes were, on the whole, in line with increased requirements of doing business in 1979 with the exception of integrated companies which more than tripled their "cash" balances by accumulating some $661 million over and above their increased inventory requirements.

Petroleum Industry: Sources and Applications of Funds

	1977	*1978*	*1979*	*Total*
			($ millions)	
Sources				
Total internal cash generation	4,259	4,969	7,129	16,357
Long-term debt (net increase)	883	1,227	1,726	3,836
Increase in equity	449	593	839	1,881
Other sources	287	704	1,111	2,102
Working capital decrease	383	548	1,139	2,070
Total	6,261	8,041	11,944	26,246
Applications				
Total capital expenditures‡	4,388	5,394	6,410	16,192
Dividends	452	510	737	1,699
Long-term debt (net decrease)	418	270	284	972
Decrease in equity	117	246	209	572
Other applications*	398	869	2,537	3,804
Working capital increase†	488	752	1,767	3,007
Total	6,261	8,041	11,944	26,246

‡ Includes expenditures outside Canada.

*Primarily includes investments in other companies and industrial take overs.

†Essentially a balancing item.

Indeed, the loss may become permanent. Each year brings a further windfall gain to the foreign-owned firms. The value of these firms and, therefore, the cost to Canadians of securing control over them, has increased three- to four-fold—equivalent to tens of billions of dollars. A further delay will put the value of companies in the industry so high as to make the cost prohibitive, leaving Canada with no choice then but to accept a permanent foreign domination by these firms.

From a Canadian ownership perspective, the current policy of providing the industry with all of the funds it needs in the form of internally-generated cash flow is undesirable. It allows a largely foreign-owned industry to expand substantially without having to seek funds from the Canadian capital markets. Thus there is little financial pressure on the industry as a whole to involve new, Canadian participation. As the industry's revenues increase, it could expand into other sectors of the economy.

Reinforcing the impact of buoyant cash flow, the system of tax incentives inadvertently fostered concentration in the industry and, with it, foreign control. While the incentives have served the purpose of encouraging investment, they have not been available on the same basis, or to the same extent, to all investors. For example, the *Income Tax Act* for many years allowed only firms whose "principal business" was resources to claim favourable write-off rates for petroleum exploration expenditures. Except in special situations, the Act permitted only investors with resource income to claim depletion allowances for such expenditures. The net result was to favour those who were already in the industry. Since these were predominantly foreign companies, the result unintentionally worked against Canadian ownership objectives.

Of the top 25 petroleum companies in Canada, 17 are more than 50 per cent foreign owned and foreign controlled, and these 17 account for 72 per cent of Canadian oil and gas sales. This is a degree of foreign participation that would not be accepted—indeed, simply is not tolerated—by most other oil-producing nations.

From a public policy perspective, the issue of *control* is equally relevant. Clearly, firms can be effectively controlled by shareholders with far less than 50 per cent of the shares. Thus, even if the oil and gas industry were more than 50 per cent Canadian owned, the industry could still be controlled, to a large degree, by foreign interests.

Governments around the world have responded to the dramatic changes in the oil industry by developing a larger public sector. In Norway, Statoil now dominates oil production. In Britain, BNOC is of growing importance. In most OPEC countries, state-owned oil firms are the main, if not sole, producers. Most European countries have established state corporations or mixed-ownership companies, many of whom are engaged in the entire spectrum of oil activities.

Within Canada, the provincial and federal governments moved in a similar fashion. Most provincial governments have for some years been directly involved in electrical generation. More recently, several provinces, including

Alberta, Ontario, Quebec and Saskatchewan, have established corporations, partly or wholly owned by the provincial government, with a mandate in oil and gas. The federal government created Petro-Canada.

Events since Petro-Canada was created have reinforced the general appreciation of the positive role that can be played—and has been played—by such an instrument, as a "window" on the industry, a stimulus to activity, and a supporter of domestic industries providing goods and services to the energy sector. Nevertheless, direct public sector participation in this sector remains too low. By world standards, the degree of private sector involvement in the Canadian oil industry is high. The industry owes much of its prosperity to cash flow and incentives provided by Canadian consumers and taxpayers, few of whom are in a position to share in the benefits of industry growth. For most Canadians, the only way to ensure that they do share in the wealth generated by oil, and to have a say in companies exploiting that resource, is to have more companies that are owned by all Canadians—more companies like Petro-Canada.

The Largest Oil and Gas Producing Companies in Canada, 1979

Rank	*Foreign Controlled*	*Canadian Controlled*
1.	Imperial	
2.	Gulf	
3.	Texaco	
4.	Shell	
5.	Amoco	
6.	Mobil	
7.		Petro-Canada
8.	Hudson's Bay Oil & Gas	
9.	Chevron Standard	
10.	Suncor	
11.		Pan Canadian
12.		Dome
13.	Canadian Superior	
14.	Aquitaine	
15.		Norcen
16.		Home
17.	Canada Cities	
18.	Petrofina	
19.		Husky
20.	BP Canada	
21.	Amerada	
22.	Union Oil	
23.	Chevron Canada	
24.		Alberta Energy
25.		Ocelot
Total Sales* by Group	$6,151 million	$1,608 million
Share of All Industry Sales	71.7%	18.7%

*Net revenues after royalties but before operating costs.

The significant fact today remains that the foreign companies control most of Canada's oil and gas industry, and of its revenues. Foreign-controlled firms control the future through their control of the land in which exploration takes place. The frontier land permits are largely held by foreign-controlled companies. Of the 290 million acres held under permit on frontier lands, 110 million acres are held by Canadian-controlled companies. Of the Canadian-held permits, Petro-Canada clearly accounts for the largest portion, about 60 per cent. It is one of the few Canadian companies capable of handling the costs and risks of frontier exploration. Dome Petroleum Limited, another Canadian-controlled company, holds a further 15 per cent. Other Canadian companies hold only very small interests in these important new resource areas. Similarly, the existing oil sands plants are dominated by foreign-controlled firms. Canadian-controlled firms represent only 34 per cent of the equity in Syncrude.

If this pattern were left undisturbed, foreign-controlled companies would account for a large part of the future energy supplies in Canada. The reinvestment of the cash flow earned by the foreign companies on their current production will help increase the size and influence of these companies.

What Other Non-OPEC Countries Do to Control Foreign Ownership in the Energy Sector

The control of foreign investment in the energy industry is widely recognized in other countries as an integral part of national economic policy. Great Britain, Norway, Australia and Mexico are four non-OPEC oil producers which have implemented a variety of measures to limit foreign ownership of production and other aspects of industry activity.

In Great Britain and Norway, the national oil companies are assured the major role in development of energy production from the North Sea. The British National Oil Corporation (BNOC) has first claim on a 51% share of oil production, but must negotiate the purchase of this share at market prices. In developing these areas from exploration to production, it may offer participation to joint-venture partners, including foreign-owned firms, but retains control of all projects.

In Norway, the Statoil en Norske Stats Objeselskap A.S. (Statoil) competes aggressively with other firms in the exploration and development of offshore areas. It is authorized to take up to a 50% interest in any block of land it does not already hold. The company takes this interest after a find has been delineated but before development and makes no payment for past exploration expenditures. It also has the option to increase its interest to 70% at its own discretion. Indeed, Statoil acts as the operator in charge of activities on all properties in which it has an investment, often with a major private oil company acting as a paid adviser.

In Australia, foreign companies are allowed to participate fully at the exploration stage. However, only Australian and "naturalized" foreign investors can produce energy resources. To qualify as "naturalized", a foreign company must have a minimum of 25% of its equity owned by Australians, a majority of Australians on its Board of Directors and a public commitment to increase Australian equity to 51%. Access by foreign firms to the Australian debt markets is restricted, and takeovers cannot normally be financed with funds raised there.

Of these four countries, Mexico has the most rigorous system of controls having nationalized the foreign-owned petroleum industry in 1938. The exploration, development and production of petroleum, other hydrocarbons, and electricity is reserved entirely for the Government. Other activities, such as the distribution and marketing of petroleum products, are reserved entirely for Mexican-owned companies.

The rapid growth that is inevitable for the energy sector in Canada over the next decade or two would strengthen further the position of these foreign oil companies, giving them even greater power in the Canadian economy than they have today. Foreign control over the total Canadian economy would be increased, and the management of the pace and priority of Canadian energy projects would be left largely in the hands of the foreign major oil companies. Yet over that period, Canadian consumers and taxpayers would contribute the cash and provide tax support for much of the investment made by these companies.

Governments the world over have recognized the uniqueness of the energy sector. Its dramatically increased importance in the economy requires special measures. Canada's rich energy strength makes the need to act even clearer. The structure of the energy sector will be a major factor shaping the structure of the Canadian economy. Canadians must play a greater role in this sector.

Security, Opportunity, and Fairness

The world may experience a decade of slow and unsteady economic growth as oil price shocks bring each economic upturn of the western economies to an abrupt halt. Canada cannot fully escape this world problem. But we need not face an uncertain supply of oil. Nor do we have to suffer economically as badly as other nations who lack our energy potential. If a way can be found to share more equitably the benefits of Canada's energy resources, it may be possible to insulate Canada from some of the shocks emanating from the world economy, and to build upon this energy strength an industrial base in all parts of Canada that will provide for sustained economic growth.

Canada is not so rich in energy that it can afford to squander its energy endowment, or put off hard decisions. To do so would be a disservice to ourselves, to future generations of Canadians, and to a world that expects us to play a role that reflects our strength. Nor, however, is Canada so imperilled by the energy situation that it must rush blindly into energy decisions to the exclusion of other pressing national concerns.

The Government of Canada believes that energy should not be a problem. On the contrary, it can be a major factor in the solution to our broader challenges, if Canada has a program to provide Canadians with energy *security*, the *opportunity* to participate in energy development, and *fairness* in the manner in which the benefits of the nation's rich resources are shared. The National Energy Program is designed to achieve these goals.

THE PROGRAM

To date, Canada's energy resource wealth has moderated the problems that confront us as they do other industrial nations. However, from the preceding discussion, it is clear that there are grounds for concern about Canada's energy outlook. Despite our strengths, the nature of our energy use and trade leaves Canada unwisely and unnecessarily vulnerable to the vagaries of the world oil market. An immediate start must be made on measures to achieve sustained energy security.

The current fiscal system concentrates petroleum wealth within Canada to a highly undesirable extent, and leaves the federal government seriously short of the revenue it requires to manage the Canadian economy, reduce regional disparities, and develop an effective national energy policy. Also, while there is an important and entrepreneurial Canadian presence in the oil and gas sector, the involvement of Canadians through private and public sector corporations is still unacceptably low. The challenge is to effect the changes required to alleviate these problems.

The National Energy Program is the federal government's response to these energy challenges. It is an energy package that includes pricing regimes, fiscal measures, expenditure programs, and direct federal action to achieve the goals of energy security, opportunity, and fairness. The specific elements of the National Energy Program, which are detailed in the following pages, will re-structure Canada's energy system to balance domestic oil supplies with domestic demand by 1990, 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, expand the role of the public sector in oil and gas, and ensure greater industrial benefits from energy development.

Pricing

The development of principles to govern oil pricing in Canada has been a matter of national debate since the Arab embargo of 1973-74. The position of the Government of Canada is based on a commitment to a single price for crude oil in Canada, subject to transportation differences, and gradual increases in that price in order to foster the development of new supplies and encourage conservation, while allowing Canadian consumers time to adjust.

A central issue has been the relationship between the price of oil in Canada and the world price. Some have argued that Canada ought to tie its domestic prices to the world price. This would be a mistake. Under such a policy, Canadian prices would reflect uncertain and erratic movements in world oil prices. Canadian economic performance would be made even more vulnerable to the economic repercussions of the world oil situation.

Revenues from oil and gas are one of the most important income streams for governments in Canada. Prices for oil and gas will therefore be a major determinant of the distribution of income between consumers and governments, and among governments. The determination of such basic national policy simply cannot be left to the actions of a foreign cartel.

Moreover, linking Canadian and world energy prices is not necessary for energy reasons. To be sure, energy prices must rise, and higher prices are one mechanism to bring about increased energy conservation. But it is equally important that consumers and producers have a clear view of steady, predictable, future price rises. There is no need to punish consumers with large, unexpected price changes.

It must be remembered, too, that price is only one route to further conservation. Societies have strong "structural" rigidities; it is not easy to bring about rapid changes in energy use. Entrenched social and economic patterns, based on relatively cheap oil, must be modified, but this takes time. Governments must move on all fronts to create a total environment that both encourages and allows consumers to cut their energy consumption. Rapid price rises in the absence of these other measures could undermine the consumer's ability to make the necessary changes.

World prices, or prices that are linked to world prices, are not necessary to encourage increases in supply. The overwhelming share of Canada's current oil and gas production was found *prior* to the rapid rise in world oil prices that started in 1973. It is not necessary to give producers windfall gains on these reserves in order to encourage new discoveries. A price mechanism reflecting Canadian costs, not international oil prices, and which offers high and predictable returns for higher-cost and risky sources, is a better way to provide the necessary incentive.

Linking Canadian natural gas prices to world oil prices is also unwise, because Canadian endowments of oil and gas resources differ: we have, judging from evidence thus far, abundant supplies of natural gas that could be produced at moderate prices, but less certain prospects in oil. Linking Canadian prices to world prices would keep the price of gas to the consumer rising at the same rate as the price of oil. This would inhibit the massive-scale substitution away from oil that must take place if Canada is to achieve energy security.

The Oil Price

The post-1973 upsurge in international oil prices, and the national consensus that Canadians should not automatically pay world prices for domestic oil, led to the establishment of controls on the price of oil produced in Canada, through a series of federal-provincial agreements.

Since 1973, domestic oil prices at the wellhead have risen in regular stages. The price in mid-1973 was $3.40 a barrel; today, it is $16.75.

As the price of imported oil is beyond Canadian control, the Government of Canada established the *Oil Import Compensation Program* (OICP),

under which refiners processing imported oil are paid federal subsidies to reduce their costs to the same level as refiners using Canadian oil.

The delivered price of domestic conventional oil in central Canada now averages about $18 a barrel. The landed cost of imported oil averages some $38 a barrel. The federal subsidy on imports is about $20 a barrel, or approximately 53 per cent of the cost. A gap of this magnitude between international and Canadian prices is a comparatively recent phenomenon. As recently as July, 1978, the per-barrel differential between world prices and domestic prices was less than $3.

As an incentive for the development and production of synthetic oil from oil sands, the Government of Canada has provided prices higher than those available to conventional oil. Domestic synthetic oil producers sell their production to refiners at a price equal to the imported oil price. The federal government subsidizes refiners purchasing synthetic oil to the extent needed to reduce their costs to the same level paid by refiners purchasing domestic conventional oil. This subsidy is financed by a federal levy imposed on all oil refined in Canada (the so-called "Syncrude Levy"). The refiners pass on the costs of this levy to consumers in the form of higher prices for petroleum products.

The New Blended Price System

The Government of Canada has decided to establish a new schedule of prices for domestic oil production, and a new price system to blend the costs of different sources of oil into one weighted-average price to consumers.

There is a broad national consensus that oil prices in Canada should rise substantially. However, they should also rise predictably, and should reflect Canadian realities. In addition, oil pricing policy should translate Canada's relative strength in oil and other energy into a competitive advantage for Canadian industries, through prices that are below those prevailing in other industrial countries. The National Energy Program incorporates prices that serve these objectives.

What is the Petroleum Incentives Board?

The proposed Petroleum Incentives Board (PIB), to be established through legislation, will fulfill the following functions:

- It will assume the role of the Petroleum Compensation Board with respect to the collection of the Petroleum Compensation Charge and the operation of the Oil Import Compensation Program. These programs will become part of the new blended price system which will be managed by the PIB.
- It will be responsible for collecting new charges, the proceeds of which will be directed to increasing Canadian public ownership in the oil and gas industry in Canada.
- It will administer the Petroleum Incentives Program.

The Board will consist of up to nine members, who will be appointed by the Governor in Council.

The members of the Board will be officials of the Department of Energy, Mines and Resources. This was the case with the Petroleum Compensation Board.

National Energy Program: Wellhead Oil Prices

	*Oil Sands Reference Price**	*Tertiary Recovery Oil† (15° API gravity)*	*Conventional Oil (38° API gravity)*
		($/bbl)	
Jan. 1980	–	–	14.75
Aug. 1980	–	–	16.75
Jan. 1981	38.00	30.00	17.75
July 1981			18.75
Jan. 1982	41.85	33.05	19.75
July 1982			20.75
Jan. 1983	45.80	36.15	21.75
July 1983			22.75
Jan. 1984	49.85	39.35	25.00
July 1984			27.25
Jan. 1985	54.10	42.70	29.50
July 1985			31.75
Jan. 1986	58.55	46.20	35.25
July 1986			38.75
Jan. 1987	63.20	49.90	42.25
July 1987			45.75
Jan. 1988	68.30	53.90	49.25
July 1988			52.75
Jan. 1989	73.75	58.20	56.25
July 1989			59.75
Jan. 1990	79.65	62.85	63.25
July 1990			66.75

*Subject to cap of international price.

†In later years, the price for tertiary recovery oil will depend upon the price for conventional oil. As the price for conventional oil approaches that for tertiary recovery, price differentials will develop to reflect quality differences, i.e., the cost of upgrading. The price of tertiary recovery oil will never be less than the price for conventional oil of a similar quality.

What Are Light and Heavy Crude Oils?

Crude oils are mixtures of many substances, mainly compounds of carbon and hydrogen, together with varying proportions of sulphur.

Oil products—aviation fuels, gasoline, diesel and heating oils, residual fuel oil and lubricants—can be manufactured from almost all crude oils.

Light crude oils currently contribute the bulk of Canada's production. They are characteristically light-coloured, easy-flowing and have a low sulphur content. Light crude oils are relatively easy to produce and refine.

Heavy crude oils now account for only about 15% of our national output, although they may be much more abundant than light crude in terms of the amount of oil actually in place in the ground. However, these dark, thick, sticky, viscous oils with a high asphalt and sulphur content are difficult to produce and costly to refine.

In some cases, little heavy crude can be recovered by primary methods, and various forms of enhanced oil recovery must be used. Expensive "upgrading" is required to refine these oils into marketable products.

Amendments to the *Petroleum Administration Act* will be needed to establish the new blended price system including a new institution, the Petroleum Incentives Board, that will run it.

Prices for Domestic Oil Production

Conventional Oil

Beginning January 1, 1981, the *wellhead price* for a barrel of conventional oil will rise $1 every six months until the end of 1983. Thereafter, until the end of 1985, price increases will take place at the rate of $2.25 every six months. Commencing in 1986, the price will be raised at the rate of $3.50 every six months, until it reaches its appropriate quality-determined level relative to the oil sands "reference price", explained below. If by 1990 the conventional oil price is still below that for reference price oil, consideration should be given to a more rapid rate of escalation.

This price schedule will provide growing revenues for the petroleum industry, and thereby ensure substantial amounts of cash to support exploration and development. It provides an attractive and certain prospect for investors in western Canadian crude oil exploration and development. The cycle of conventional oil exploration and development—land acquisition, geological and geophysical surveys and their evaluation, exploration drilling, and the subsequent development of discoveries—takes three to four years. This means that an investor embarking now on a search for oil would not likely have oil production until 1984. By that time wellhead prices will reach about $25 a barrel with a rapid increase from that level then being immediately in prospect. This outlook will provide strong encouragement to industry's efforts directed to early development of the approximately 3 billion barrels of light and medium crude oils that, according to various government agencies, await discovery in western Canada.

The price schedule will provide a very high price towards the end of the decade. Prices at the wellhead in 1990 will be four times present levels. This price outlook is one that many industries would envy.

These prices also provide fair, growing payments to the producing provinces for the use of their oil. At the same time, the rise is moderate in the early years, avoids sudden and unnecessary price shocks to the Canadian economy, and provides both the clear signal and the needed time for Canadians to shift away from oil. By the end of the decade, oil prices in Canada will be much higher, but Canadians' dependence upon it will have been reduced substantially.

World oil prices are arbitrary and artificial. They do not reflect conditions of competitive supply and demand, nor the costs of production in Canada or other countries. The Government is determined that the price of Canadian oil will not be linked to world prices, but rather will be "made-in-Canada"—determined on the basis of Canadian circumstances, and the needs of Canada's economy. The schedule of price increases for conventional oil will satisfy this criterion.

Higher Cost Oil

The price of conventional oil is, at present, a price paid largely for oil already found. Some of the new sources of oil are not economic at conventional oil prices, and require higher prices. These need not be as high as the international price. Large quantities of oil from high-cost sources in Canada—oil sands, enhanced oil recovery, and frontier oil—can be profitably produced at less than projected international prices. The National Energy Program includes made-in-Canada prices for integrated oil sands and heavy oil projects, including Esso Resources' Cold Lake venture, and for enhanced oil recovery projects. These prices reflect Canadian cost conditions, and are called reference prices. They are designed to provide attractive returns to new sources when they come on stream, and to provide new certainty to the industry.

The National Energy Program provides a reference price for synthetic crude oil from the oil sands. This will be *the lesser of* $38 a barrel, effective January 1, 1981, and escalated annually thereafter by the Consumer Price Index, *or* the international price.

The Program also includes incentives for oil produced using approved tertiary enhanced recovery methods. A "tertiary supplement" will be paid by the Government of Canada to qualifying producers. This supplement will be additional to the conventional oil wellhead price. For a company producing a representative 15 degree crude oil through approved tertiary methods, the total wellhead price as of January 1, 1981 will be approximately $30 a barrel. The supplement on that date will be approximately $14 a barrel, applied equally to all qualities of crude oil. The tertiary reference price will be adjusted annually, in a manner similar to the method of changing the oil sands reference price.

What is Enhanced Oil Recovery?

Of the total oil in place in a reservoir, far less than half is typically recovered. On average, recovery rates for light crude oil in Canada have been about 30%. For the heavy oils in the Lloydminster region of Alberta and Saskatchewan, the recovery rate under normal techniques may be as low as 5%.

The various oil recovery methods may be defined as follows:

- *Primary Recovery*—crude oil recovery from a petroleum reservoir as a result of the natural energy of the reservoir moving the crude oil toward producing wells.

- *Secondary Recovery*—the additional crude oil recovery from a petroleum reservoir obtained by supplying energy to supplement or replace the energy of primary recovery. Generally, the term refers to already technically and economically proven methods such as waterflooding, and gas injection.

- *Tertiary Recovery*—the additional crude oil recovery from petroleum reservoirs through the application of third generation methods. These methods are the newer, less technically proven techniques such as thermal processes—including steam injection and fire-flooding—carbon dioxide flooding, hydrocarbon miscible flooding, and chemical flooding.

For purposes of the National Energy Program, "enhanced recovery" means tertiary methods of oil recovery.

This new incentive will not affect current wellhead price differentials arising from quality differences. However, as wellhead prices begin to escalate faster than $1 a barrel every six months, an examination will be made of quality differentials to see whether they are suitable in view of the costs of upgrading oil in central upgraders or Canadian refineries generally.

Implementation of this tertiary recovery incentive depends upon the full co-operation of the oil-producing provinces. The Government of Canada is anxious to conclude agreements with these provinces, so that the industry can plan on the basis of this attractive new regime. To ensure that the incentive has the intended stimulative effect, it will be offered only in provinces that maintain or, preferably, enrich existing fiscal incentives for tertiary production.

An incentive will also be offered to facilities that upgrade heavy crude oil. The amount of this incentive will depend on the cost of the upgrading process, having in mind that the total price for upgraded heavy oil from tertiary recovery should not exceed the price offered to oil sands production. Petro-Canada and Saskoil (Saskatchewan's Crown oil corporation) will carry out on a priority basis a detailed feasibility study of an upgrading plant in that province. On the basis of that study, the level and nature of incentive will be established.

A reference price for specified frontier oil and other domestic sources may be established when more is known about the costs of bringing these new supplies on stream, and the timing of production.

The oil sands price system described above will apply to production from the plant operated by Syncrude Canada Ltd. This system will provide a substantially higher return on this project than was contemplated when the initial investment was made.

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

In the past, the Government of Canada has made its offer of incentive prices for the large integrated oil sands plants conditional upon the project in question satisfying guidelines relating in particular to the use of domestic goods and services, and participation and employment of native peoples. On the evidence to date, the companies involved are sensitive to the concerns and aspirations of the native people affected by major projects. The Government of Canada will condition its offer of reference prices on satisfactory private initiatives in this regard. In addition, acceptable progress toward our Canadian ownership objectives, described later in this document, will be a condition of the reference price offer.

Blending In the Cost of Imported Oil and Reference Price Oil

The second new feature of the blended price system will be to fold the total cost of oil imports, over time, into the price that all oil consumers pay. This will be done by a simple extension of the existing system of refinery levies. When the system is fully phased in, all domestic refiners will pay a new Petroleum Compensation Charge, which incorporates the Syncrude Levy, to cover the costs of oil import compensation. Revenues from this Charge will be used to pay importing refiners an amount sufficient to reduce the average cost of imported oil to the average cost of oil to Canadian refiners. By the end of 1980, this Charge will be $2.55 a barrel, consisting of $1.75, the existing Syncrude Levy, plus 80¢ to cover a portion of oil import compensation costs. The Petroleum Compensation Charge will be increased by $2.50 a barrel on January 1 of 1981, 1982, and 1983.

Effectively, then, domestic refiners will be paying a blended price that is the weighted-average cost of imported oil and the various streams of domestic oil. In the process, the burden of imported oil prices will have been shifted from the taxpayer to the oil consumer. The shift will occur gradually to ensure that price increases do not result in hardship for individuals or businesses. The phase-in of the costs of imported oil will occur at such a rate that the wellhead price plus the import cost phase-in rises less than $4 in 1980. The wellhead oil price plus the Petroleum Compensation Charge will rise by $4.50 a barrel in 1981, 1982, and 1983. Until the blending system is fully in operation, the Government of Canada will continue to provide substantial subsidies to oil consumers out of its general revenues.

Under the blended price system, Canadian oil consumers will pay prices that, while rising substantially, will remain significantly below world prices. The blended price will never exceed 85 per cent of the international price or the average price of oil in the United States, whichever is lower.

The gradual nature of the shift towards full implementation of the blended price system should allow adjustments to occur without serious difficul-

Illustrative Blended Price Calculation

	Aug. 1980	*Dec. 1980*	*Dec. 1981*	*Dec. 1982*	*Dec. 1983*
			($/bbl)		
Price Levels:					
Wellhead price (Conventional)	16.75	16.75	18.75	20.75	22.75
Petroleum Compensation Charge	1.75*	2.55	5.05	7.55	10.05
Blended Price†	18.50	19.30	23.80	28.30	32.80
Annual Changes:					
Wellhead		3.00	2.00	2.00	2.00
Petroleum Compensation Charge		0.80	2.50	2.50	2.50
Total		3.80	4.50	4.50	4.50

*Syncrude Levy was $1.75 in August 1980.

†Transportation costs to particular refining centres are additional.

ty. However, the price of imported oil, over which Canadians have no control, will continue to influence the total cost of oil to the Canadian economy. Conversely, as Canada succeeds in its efforts to reduce reliance on oil imports, the reduction of the share of imports in our total oil supply will have a moderating effect on the blended price. Thus, the new system gives all Canadian oil consumers a personal financial interest in moving Canada off the world oil market.

The Natural Gas Price

Pricing policy for natural gas must meet two needs: provision of adequate incentive to production, and strong encouragement for consumers to use natural gas in preference to oil. Producers' returns from natural gas have risen dramatically since the mid-1970s — in fact, faster than oil prices, despite a growing surplus of gas. Producer netbacks have increased from 8¢ a thousand cubic feet (Mcf) in 1970 to 37¢ in 1975 and 94¢ in 1979 — a nearly twelve-fold increase. Thus there is already ample price incentive for new gas production, and prices will continue tc rise.

The producers' problem is markets. Even with the recent approvals of new gas exports, the industry will have substantial excess production capacity. In the past, the preferred outlet for surpluses has been the export market. However, automatic recourse to foreign sales, when the gas could replace imported oil if sold in Canada, is undesirable. Thus the challenge is to find means whereby the producers' desire to expand markets can be addressed through determined efforts to increase dramatically the use of natural gas in Canada at the expense of oil. This requires attractive price incentives to the consumer.

In the past, gas producers have enjoyed wellhead price increases as a result of a policy of raising gas prices at Toronto by 15¢ a thousand cubic feet for every $1.00 increase in the wellhead price of oil. This policy will continue, with the exception of 1981. In order to make room for the new federal tax on natural gas sales, which will be applied in lieu of a gas export tax, there will be a one-year pause in wellhead price increases for gas sold into the domestic market. Because of the spectacular rise in returns enjoyed by gas producers over the last five years, this pause should not materially affect the financial well-being of the producing industry.

As in the case of oil, consumer prices for gas under the National Energy Program will reflect a combination of taxes designed to provide revenue for the federal government, and wellhead price increases, designed to provide increased revenues to producers, and producing provinces. Gas prices to the consumer will, however, rise less quickly than oil prices in order to encourage a shift away from oil to natural gas.

The federal government will establish city-gate prices for natural gas shipped inter-provincially, for all centres east of Alberta. For the three-year period commencing November 1, 1980, the price of that gas will rise 45¢ an Mcf per year. Under previous policies, gas prices would have risen 67½¢ an Mcf

per year as a result of a $4.50 per year increase in the price of oil. The ratio of gas prices to oil will thus fall significantly over time, providing a substantial stimulus to substitution efforts.

In establishing city-gate prices, the federal government will set prices in Toronto, Montreal, Quebec and Halifax at the same level. This policy will ensure the financial viability of the pipeline to the Maritimes. City-gate prices in areas west of TransCanada PipeLines' (TCPL) eastern zone will be linked to the eastern Canada price, but will continue to be somewhat lower, reflecting lower transportation costs.

Within British Columbia, Alberta and Saskatchewan, the price of gas produced and consumed within the province is set by the provincial government. Federal policies may affect these prices because gas consumers in these provinces will pay the same taxes as those in the rest of the country.

Comparison of Crude Oil and Natural Gas Prices: Annual Averages

Date	*Eastern Canada Gas Price*	*Gas Price as a Percentage of Oil**
	($/Mcf)	(%)
Historical		
1970	0.43	75
1971	0.43	70
1972	0.48	77
1973	0.49	67
1974	0.59	52
1975	0.88	64
1976	1.33	83
1977	1.58	83
1978	1.90	83
1979	2.06	81
1980	2.42	80
Under the National Energy Program		
1981	2.98	71
1982	3.39	68
1983	3.84	67

*$1 Mcf=$5.803 bbl.

Energy Taxes

Reference has already been made to the major shortcomings of the prevailing tax and revenue-sharing system. While it provides generous incentives to exploration and development, which remain essential to the success of our energy goals, it would leave to the industry more cash flow in future than is necessary. Industry would have little need to seek out Canadian investment capital. There are other problems with the existing structure. The system now in place gives the natural gas industry a strong orientation towards the export

market, because of the higher prices earned from foreign sales as opposed to domestic markets, and is unfair because it imposes taxes on one energy export — oil — and not others.

In terms of inter-governmental sharing, the existing system is unfair to the Government of Canada. It gives most of the revenue to the producing provinces and the industry, leaving the national government with insufficient revenues to address the country's economic burdens, including those caused by rapidly rising world and domestic energy costs.

The National Energy Program establishes a new system designed to provide adequate incentive to the industry, while avoiding unfair windfall gains. The system will provide ample — but not excessive — cash flow from existing reserves, offer substantial investment incentives for exploration, and attract new sources of Canadian risk capital.

The Program will create a framework for more balanced revenue sharing between the producing provinces, who are entitled to large and growing revenues from their resources, and the Government of Canada, which has a national claim, on behalf of all Canadians, to a share of the industry's revenues.

More than ever, energy is a special case. One manifestation of this is the hesitation on the part of Canadians everywhere to export energy without adequate assurance of long-term domestic supplies. The Government of Canada has established export review procedures designed to respond to this concern. Exports will be allowed only to the extent that they do not jeopardize Canadian needs, and then only if full and fair returns are received for this energy.

Events in the world energy market have created new demands from outside Canada for Canadian energy resources, and caused their prices to rise substantially. This has provided major windfall gains, which should be distributed fairly.

These same international market factors have heightened Canadians' desire to use our own energy resources instead of imported supplies. It is essential that our policies encourage this substitution process. Moreover, from the perspective of industrial and employment policy, it is better to use the energy here as an input to industry than to export it in raw form. The most direct way to ensure that there is no bias in favour of energy exports is to reduce the relative attractiveness of the export market, so that producers do not earn more from exporting energy than from serving Canadian needs.

The Government of Canada endorses the premise that some energy exports are desirable, from regional and national viewpoints. Export sales bring welcome earnings to improve our trade balance, and to help finance the search for new supplies. However, the export market must not drive our energy policies, or dominate corporate decisions. Our first priority must be to put our domestic energy house in order — to end the paradox of oil shortfalls in the face of energy surpluses. In addition, there must be a fiscal system that provides a reasonable amount of revenues for the Government of Canada.

For all these reasons the proposals presented to the producing provinces incorporated a federal tax on natural gas exports. The Government of

Canada was prepared to introduce a system in which the economic rent resulting from higher international prices for gas exports would have been shared between the producers, the federal government and the provinces. The Government of Canada also indicated that it was prepared to introduce a tax on electricity exports in order to ensure that energy exports were treated on an equitable basis.

The governments of Alberta and British Columbia have strongly opposed a natural gas export tax. They have argued that such a tax is an intrusion on their resource ownership rights. They also argue that taxes on gas exports are discriminatory.

The Government of Canada rejects these arguments. There is no doubt of the federal government's constitutional right to impose export taxes on any commodity. To deny this is to attempt to extend provincial powers well beyond their present constitutional limits. The federal government imposed an export tax on electricity for 38 years, from 1925 to 1963. Similarly, the federal government established a tax on oil exports in 1973. It continues to impose this tax.

A tax on natural gas exports is not discriminatory. These exports have earned enormous economic rents as their price has soared due to OPEC's price increases. Taxation based on the ability to pay is in accord with long-established principles.

Recognizing, however, the strong opposition of Alberta and British Columbia to the gas export tax, the federal government offered to discuss arrangements whereby there would be a sharing of provincial revenues when a province's revenues grew very much larger than those of other provinces. This offer to pursue an alternative which would have yielded the federal government little revenue, but would have worked towards reducing disparities between provinces, was also rejected. The Alberta government took the view that this proposal was neither feasible nor appropriate as an alternative in the context of the current oil and gas pricing negotiations.

However, the problem remains. The Government of Canada lacks the revenues necessary to fulfill its national obligations. Some of these obligations flow from the same international oil crisis that provides growing revenues to the governments of Alberta and British Columbia.

Thus, the federal government has faced a difficult choice. The most suitable and straightforward solution has been rejected by two of the provinces. Yet the national needs, the needs of Canadians in all provinces — including those in Alberta and British Columbia — are pressing. The Government of Canada recognizes that this is a critical time in the history of the nation. Its actions in the energy sector must be ones which unify the country, rather than increase the strains on the federation. It is a time when all governments must temper principle with flexibility.

The Government of Canada is, therefore, not proceeding with a natural gas export tax. This tax would have provided the federal government with a major source of the revenues needed to meet its national energy obligations.

New Taxes on Oil and Gas

To compensate for these foregone revenues, the federal government will need new sources of funds. One potential new source is the Petroleum Compensation Charge. Once the cost of imported oil has been phased into the blended price, this Charge could be used to generate revenues for the federal government. The amount and timing of these revenues depends on the behaviour of international oil prices, and our success in reducing oil imports. If world prices rise dramatically, and oil imports continue to increase, the Charge will have to be completely dedicated to paying for import compensation. If, however, world prices rise slowly, and imports gradually fall, the Charge could begin to generate some net revenue for the federal government towards the end of 1982.

Over the next few years, however, the Charge will not be a major source of uncommitted revenue. Its main contribution will be in reducing the federal government's import compensation burden. Another source of revenue is needed. The Government of Canada will, therefore, impose a new natural gas and gas liquids tax.

All natural gas sales will be subject to the tax, including those to the export market. There is no reason to exclude exports from a tax payable on all gas produced and consumed in Canada. That portion of gas which enters the export market will be exempt from the tax until February 1, 1981, because of the agreement with the United States government requiring Canada to give 90 days' notice of price changes.

Effective November 1, 1980, the tax will be 30¢ an Mcf. The tax will increase by a further 15¢ an Mcf on July 1, 1981, and by 15¢ an Mcf on January 1, 1982 and January 1, 1983.

Natural Gas Prices and Taxes

	Cumulative Natural Gas Tax	*Eastern Canada City-Gate Price*	*Total*
		($/Mcf)	
Oct. 31, 1980	—	2.60	2.60
Nov. 1, 1980	0.30	2.60	2.90
July 1, 1981	0.45	2.60	3.05
Jan. 1, 1982	0.60	2.60	3.20
Feb. 1, 1982	0.60	2.75	3.35
Aug. 1, 1982	0.60	2.90	3.50
Jan. 1, 1983	0.75	2.90	3.65
Feb. 1, 1983	0.75	3.05	3.80
Aug. 1, 1983	0.75	3.20	3.95

Producers will not suffer any reduction in the price which they currently obtain for their exports or their domestic sales, except for a small loss due to the taxation of pipeline fuel. In setting the export price of natural gas in the future, the price will be adjusted to take into account this tax.

A similar tax will be imposed on liquefied petroleum gases (LPGs).

What Are LPGs?

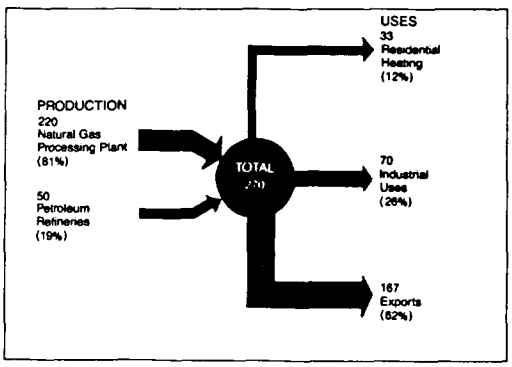
"LPG" is short for "liquefied petroleum gases", and refers to propane, butane and, for purposes of this document, ethane. These products are hydrocarbons, which means that they are compounds of hydrogen and carbon. They are part of a large family of hydrocarbons that includes methane (the principal constituent of natural gas), and heavier compounds such as pentane and octane (constituents of gasoline).

LPGs can be liquefied at relatively low pressure at atmospheric temperatures. As a result, they can be conveniently stored and transported as liquids in light pressure tanks. They can also be economically transported in liquid form, over long distances in pipelines. When the pressure is reduced, the liquid boils, releasing a clean-burning gaseous fuel.

LPGs can be used in a great variety of applications. They provide a convenient form of energy for rural communities, farms, restaurants, schools, hospitals and construction camps. Common applications include gasoline blending, heating, cooking and crop-drying. LPGs are efficient, clean-burning internal combustion engine fuels and can replace gasoline and diesel fuels in automotive uses. They are also a feedstock for the refining and petrochemical industries and are injected into oil reservoirs to enhance oil recovery.

LPGs are produced in Canada from gas plants and oil refineries (see chart). Gas plants, which extract LPGs from natural gas, account for over 75% of total Canadian production. Refineries account for the rest.

Liquefied Petroleum Gases: Production and Use 1979 (thousands of barrels a day)



Sharing the Oil Export Charge Revenues

At present an export tax is levied on oil equal to the difference between the domestic price and the export price. This is justified because Canada is a net importer of oil. There should be no incentive for provinces or producers to export oil as long as Canada continues to import it. For this reason the Government will maintain its oil export charge.

Virtually all of the crude oil now exported from Canada, aside from volumes exported on an exchange basis with United States refineries, is heavy crude oil. This oil is currently surplus to Canadian needs because Canada does not have the refinery capacity to use it. The National Energy Program includes measures to build an upgrader in Saskatchewan to turn this heavy crude oil into a product that can be processed in Canadian refineries. It is expected that other

upgraders will be built in either Saskatchewan or Alberta, and that existing refineries will be modified so that they can use increasing proportions of this oil. Hence, there should be a progressive diversion of these export volumes into the domestic market.

In the meantime, it is only fair to examine how the revenues from the export charge should be shared. At present, neither the Alberta government nor the Government of Saskatchewan gains any benefit from the higher earnings on crude oil exports. The Government of Canada is prepared to share with the two producing provinces 50 per cent of the export charge revenue on crude oil exports, found by the National Energy Board to be surplus to Canada's needs, that are now subject to the tax. Sharing will begin on November 1, 1980.

This commitment will be reviewed at the end of 1985. It is hoped that by then—through concerted efforts in which the provinces will have to join fully—these exports will have been phased out, and the oil used in Canada.

Petroleum and Gas Revenue Tax

The present tax system has provided generous investment incentives, especially for the large firms who traditionally are better able to use tax incentives. Combined with provincial incentives, the federal regime results in very low after-tax costs of investment. The effect of these systems has been positive in terms of energy supply objectives. However, it has had the effect of eroding the federal tax base, and leaving some large and profitable petroleum producers in a position where they pay no federal income tax at all. This degree of incentive is unnecessary, and unfair to the average taxpayer.

It would be possible to increase somewhat the federal government's revenues from oil and gas by reducing exploration investment incentives. However, this would raise the cost of exploration to the industry, and could undermine our energy objectives. Thus, while making necessary changes in the nature of the incentive, to be described later, the Government will strengthen the incentive for exploration by Canadians. Having done so, it will obtain a part of its revenue needs through the imposition of a tax on net oil and gas production revenue. This tax will not be an income tax, and therefore will be contained in a new act, separate from the *Income Tax Act.*

A major consideration in establishing the level of the new tax is the industry's need for cash flow. The industry must have access to adequate funds to do the job. Some of its activities—notably exploration—cannot be readily financed through debt: either internal funding or new equity capital is needed. Some members of the industry have suggested, however, that the oil and gas sector must have cash flow equal to *all* of its projected capital investments. The Government finds this view difficult to accept. While Canada assigns high priority to new supply development, there is no compelling reason why the oil industry need enjoy such a favoured position, particularly when the returns from the industry's investments are so attractive compared with those in other sectors.

The pricing and fiscal system need not relieve the industry of the obligation to seek outside capital; indeed, one objective of the Program is to increase the flow of Canadian investment capital into the sector. Thus the new tax will be set at a level that achieves a more realistic balance between the interests of the industry and those of the Canadian taxpayer.

Initially, the tax will be set at the rate of 8 per cent of net operating revenues related to the production of oil and gas, including income from oil and gas royalty interests. Deductions such as those for exploration and development expenditures, capital cost allowances, and interest, will not be allowed. As oil and gas prices rise faster than $1 a barrel every six months, the rate of the tax will be reviewed.

The tax will be general in its application. It will apply to individuals, private business firms, and to public sector business enterprises that derive income from oil and gas production. The tax itself will not be deductible for income tax purposes. It will come into effect on January 1, 1981, applicable to net operating revenues earned in 1981 and thereafter.

This tax, in combination with other federal and provincial taxes and royalties, will produce a high marginal tax rate for firms that reinvest little of their cash flow. This is consistent with the thrust of the Program — to secure from non-investing firms the revenue to support cash incentives to more aggressive companies and individuals. There will, however, be situations where firms are exposed to hardship due to provincial royalty rates in excess of 50 per cent. In such cases, it would seem reasonable to expect the province in question to adjust its royalties.

The Incentive System for Oil and Gas

The National Energy Program will reinforce the commitment to new supply development. Incentives will be improved where needed. Similarly, however, the Government of Canada must review carefully whether there are areas where incentives are no longer warranted in view of the private investor's expected risks and rewards. It must also consider whether the form of the incentive is consistent with the objective of increased Canadian ownership.

Earned Depletion Allowance

This review has indicated a need, on both counts, to change the earned depletion allowance provision.

At present, the income tax system allows taxpayers to claim a deduction, called the depletion allowance, generally equal to one-third of oil and gas exploration, development, and certain capital expenditures related, for example, to oil sands plants. The following changes will be made, effective January 1, 1981.

- *For corporations, the depletion allowance for domestic exploration expenditures* will be earned at 33⅓ per cent of qualifying expenditures, net of any incentive payments, incurred in 1981.

- *Thereafter, the depletion allowance for domestic exploration expenditures outside the Canada Lands* will be phased out. The rate will be reduced to 20 per cent in 1982, 10 per cent in 1983, and to zero in 1984.

- The depletion allowance for expenditures on *conventional oil and gas development* will be eliminated.

- The depletion allowance for approved expenditures on *integrated oil sands projects, enhanced recovery projects, and heavy crude oil upgraders* will be earned at 33⅓ per cent of qualifying expenditures, net of any incentive payments, incurred in 1981 and thereafter.

- Qualifying expenditures will be defined to exclude certain administrative and overhead costs.

- In all cases, earned depletion will be deductible up to a ceiling of *25 per cent of resource income.*

- The depletion allowance will not be claimable by individuals.

Petroleum Incentives Program

Clearly, the changes to the depletion allowance system, in isolation, would cut heavily into the incentive to invest in activities that are important to achievement of energy security. Thus, new incentives are needed.

The major incentives available to date for exploration have been delivered through the income tax system. Thus only taxpaying firms and individuals have been able to make immediate use of these incentives. A new system is required to provide incentives not only to those, but to other Canadian investors. Moreover, the Government of Canada has promised to provide a replacement for the former "super-depletion" allowance for frontier exploration, which expired on April 1, 1980.

The National Energy Program will, therefore, use new federal revenues from the oil and gas sector to provide generous direct incentives for oil and gas exploration and development. These will more than compensate, in many cases, for the reduction of earned depletion incentives. Moreover, unlike earned depletion, which tends to favour the larger, foreign-owned firms, they have been structured to encourage investment by Canadian companies and individuals.

Under the Petroleum Incentives Program, legislation will be introduced to authorize payments as follows:

- For *oil and gas exploration anywhere in Canada*, enterprises that are at least 50 per cent owned by Canadians, and are Canadian-controlled,

will qualify for an incentive payment equal to 10 per cent of approved costs incurred in 1982 and 1983, and 15 per cent thereafter.

Enterprises that are at least 75 per cent Canadian owned and Canadian controlled, will qualify for a 35 per cent incentive payment for approved costs incurred in 1981 and thereafter.

- For *oil and gas development anywhere in Canada*, and approved capital expenditures for *integrated oil sands projects, tertiary recovery projects, and heavy crude oil upgraders,* enterprises that are at least 50 per cent Canadian owned, and are Canadian controlled, will qualify for an incentive payment of 10 per cent of approved costs incurred in 1982 and thereafter.

  Enterprises that are at least 75 per cent Canadian owned and Canadian controlled, will qualify for a 20 per cent incentive payment for approved costs incurred in 1981 and thereafter.

- For *exploration on the Canada Lands*, in addition to the payments for exploration anywhere in Canada, all enterprises will qualify for an

Oil and Gas Incentives Under the National Energy Program*

	Provincial Lands				*Canada Lands*			
Year	*Depletion*†	*Incentive Payments*			*Depletion*†	*Incentive Payments*		
Canadian Ownership Rates‡		0-50%	50-75%	75%+		0-50%	50-75%	75%+
Exploration								
1981	33⅓	Nil	Nil	35	33⅓	25	35	80
1982	20	Nil	10	35	33⅓	25	45	80
1983	10	Nil	10	35	33⅓	25	45	80
1984	Nil	Nil	15	35	33⅓	25	50	80
Development								
1981	Nil	Nil	Nil	20	Nil	Nil	Nil	20
1982	Nil	Nil	10	20	Nil	Nil	10	20
1983	Nil	Nil	10	20	Nil	Nil	10	20
1984	Nil	Nil	10	20	Nil	Nil	10	20
Non-conventional and tertiary oil projects, and crude oil upgraders								
1981	33⅓	Nil	Nil	20	(not applicable)			
1982	33⅓	Nil	10	20	(not applicable)			
1983	33⅓	Nil	10	20	(not applicable)			
1984	33⅓	Nil	10	20	(not applicable)			

*As a percentage of allowable expenditures.

†Depletion will be earned on qualifying expenditures *net* of any incentive payments.

‡Canadian-owned firms must also be Canadian controlled to be eligible for the larger incentive payments. Individual Canadians are eligible for the same payments as firms with a Canadian Ownership Rate of at least 75%.

incentive payment of 25 per cent of approved costs incurred in 1981 and thereafter.

Enterprises that are at least 50 per cent owned by Canadians, and are Canadian controlled, will qualify for a further *additional incentive payment* equal to 10 per cent of approved costs incurred in 1981 and thereafter.

For enterprises that are at least 75 per cent Canadian owned and Canadian controlled, the *additional incentive payment* will be equal to 20 per cent of approved costs incurred in 1981 and thereafter.

- In all cases, *Canadian individuals will be entitled to the same incentive payments as enterprises that are at least 75 per cent Canadian owned and Canadian controlled.*

The phase-in of the incentive program applicable to firms that are between 50 and 75 per cent Canadian owned reflects the fact that the earned depletion allowance for exploration will not be changed until 1982. Many firms that now enjoy the benefits of earned depletion would not, because of low Canadian ownership levels, qualify at present for the new incentives. The continuation of earned depletion for one year in its present form provides a reasonable period of time for these firms to increase their level of Canadian ownership to a point where they would qualify for the new incentives.

The Petroleum Incentives Program will be administered by the Petroleum Incentives Board. In all cases, the definition of "approved" costs will take into account the extent to which the expenditures give the applicant a commensurate beneficial interest in the oil or gas property.

Heavy Crude Oil Processing Plants

Crude oil upgrading plants, whether or not part of an integrated oil sands production facility, that convert heavy crude oil into a light marketable crude will be treated, for income tax purposes, as a resource activity instead of as manufacturing and processing. As a result, the income from such operations will be eligible for the resource allowance, and the capital expenditures on the plant, and the machinery and equipment used in processing, will qualify for depletion allowance. As already noted, the Petroleum Incentives Program will apply to these plants.

Natural Gas Bank

In deciding to approve the proposal to "pre-build" portions of the Alaska Highway Natural Gas Pipeline, and to export additional volumes of Canadian natural gas through this facility, the Government of Canada was especially conscious of the need to provide early markets and substantial cash flow to Canadian gas producers. It was particularly mindful of the financial difficulties of the small companies, many of them Canadian owned.

The Government is concerned that, even with the new gas export approvals, gas markets may not grow as quickly as reserves discovered by small Canadian firms, many of whom still do not have sales contracts. This could put such firms in a situation where, despite successful exploration efforts, they face severe cash-flow problems. In the medium term, the increased sale of natural gas in domestic markets should relieve some of these problems. However, this will not solve the short-run difficulty faced by these small companies, who may be forced either to curtail their exploration efforts in Canada or to sell their assets to larger firms with better access to markets and more assured cash flow.

The National Energy Program addresses this problem with a novel financial vehicle designed to help Canadian companies. A new Crown corporation will be organized to enter into commercial arrangements to provide these firms with a source of cash flow, to finance exploration in Canada. This Gas Bank will be prepared to purchase from Canadian-owned and Canadian-controlled firms gas that cannot find markets; to enter into joint-venture operations; or to provide production loans. The Government is prepared to commit over $400 million to this program, which will begin in 1981.

Canada Lands

Under the British North America Act, large areas of Canada fall within federal jurisdiction. These Canada Lands, which comprise almost twice the area of the 10 provinces combined, include the area off Canada's coasts, the Yukon and Northwest Territories, and small areas scattered throughout Canada.

There is some debate as to whether offshore resources in these Canada Lands fall under federal jurisdiction. Notwithstanding a ruling by the Supreme Court of Canada in 1967 that lands off the west coast are within federal jurisdiction, both Newfoundland and Nova Scotia have laid claim to jurisdiction of areas off the east coast.

The Government of Canada believes that the offshore resources belong to all Canadians. It is anxious to refer the matter of ownership quickly to the Supreme Court. Uncertainty about the legal control over such vital areas is not conducive to the rapid development of the oil and gas potential of this promising region, which can contribute to Canada's energy needs and the economic aspirations of the region.

The Government of Canada originally offered the Atlantic provinces a revenue-sharing arrangement whereby they would obtain at least 75 per cent of the mineral resource revenues, including royalty payments in respect of oil and gas production. The Government of Canada was prepared to bear all of the costs of administering these areas. This offer was rejected by the Government of Newfoundland, and the Government of Nova Scotia terminated its earlier agreement.

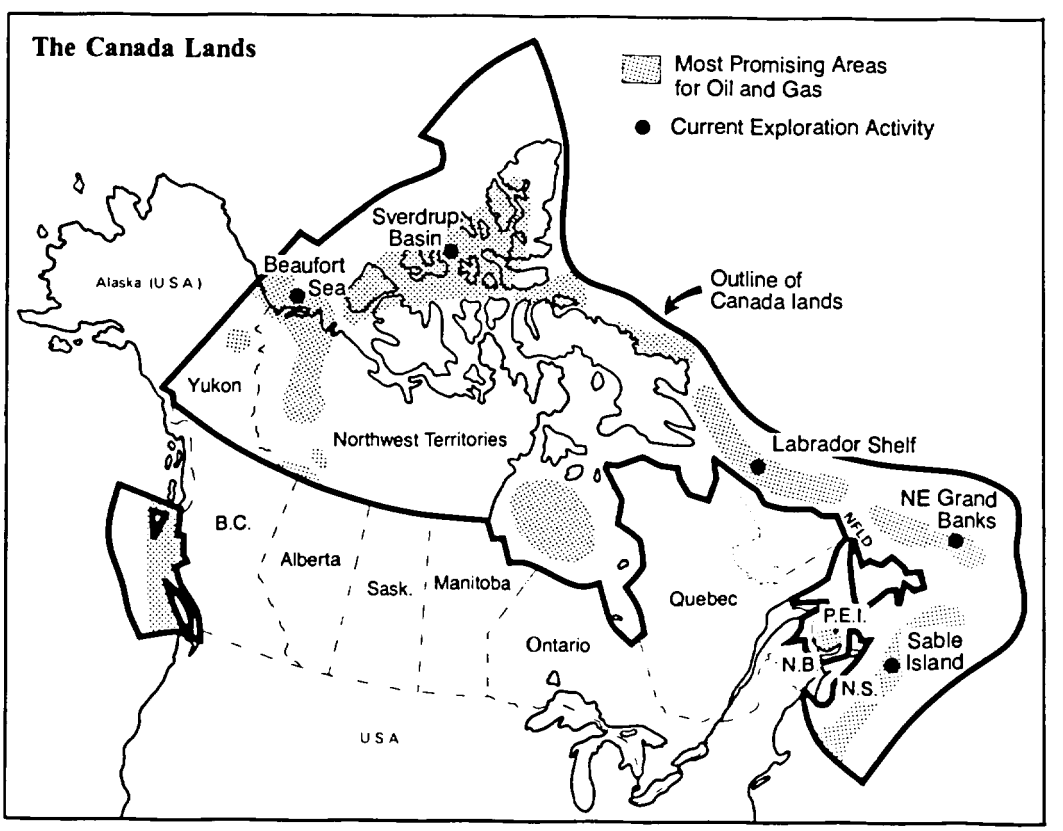
In the context of the recent constitutional talks, discussions were reopened. Seeking a speedy and fair resolution to this issue, the Government of Canada offered to:

- Provide 100 per cent of provincial-type resource revenues to the adjacent province, subject to arrangements whereby, when the province reached an agreed level of wealth, these revenues would be shared with other Canadians.
- Give the provinces a substantial voice in matters of direct concern to them, including in particular the need to minimize social, environmental and economic disruption in the region.

Unfortunately, the offshore resource issue was not resolved.

However, in its management of these resources, the Government of Canada is determined to take into account the needs of the region. It will use its regulatory powers to accelerate exploration in this area. Development must reflect the social and economic concerns and legitimate aspirations of the residents of coastal provinces. Furthermore, Canada's east coast fishery resources and the general environment must not be damaged in pursuit of energy objectives.

The acceleration of exploration in this area promises thousands of new jobs, supplying the services and goods needed to carry out the program. This represents one of the most exciting opportunities available to this region.



Indeed, properly managed, the exploration activities could provide the basis for a major, sustained, economic upsurge. The Government of Canada will ensure that these opportunities are realized.

These development opportunities will benefit all Canadians. In Western Canada, the oil service industry is largely Canadian owned, and it is a dynamic and profitable industry. Offshore drilling, however, has thus far tended to be dominated by foreign firms. This type of drilling requires large equipment and more sophisticated technology. Also, the offshore production facilities that would be required will be at the leading edge of technology. Canadians should be in the forefront in this effort. Canadians have the ability to capture these opportunities, and the Government wishes to support Canadian firms seeking to do so.

To this end, discussions will be initiated with private sector associations and individual companies, to develop a concerted response to the opportunities related to offshore development, so that the benefits will be as large and widespread as possible. The Government will use its regulatory powers, too, in support of an expanded Canadian presence across the spectrum of industrial activities related to the petroleum boom.

The development of Canada's northern Territories represents another set of challenges. In *An Energy Strategy for Canada*, published in 1976, the Government of Canada announced a desire to accelerate exploration in Canada's north. Knowledge of the resource potential of the north was inadequate. There was a compelling "need to know" about this potential. Production of these resources will not come for some years, and the economics of exploration from a company's point of view are, for the most part, unattractive compared with opportunities in southern Canada. Accordingly, the federal government put in place new incentives (such as the frontier depletion allowance), fostered involvement by Canadian companies (through the Panarctic consortium) and deployed new institutions (Petro-Canada), all of which saw the Canadian taxpayer finance the lion's share of the cost of northern exploration.

It remains necessary to provide a strong incentive for northern exploration. The energy world is uncertain. While in the long run the oil problem will only be solved by the world getting off oil, the need to find new petroleum supplies is still urgent. Canada may not need its resources in the north for domestic markets until the 1990s, but there may be merit in using Arctic oil in Canada, should viable deposits be developed, to relieve the pressure on Alberta's reserves. In the case of natural gas, the need for Arctic gas in Canadian markets may not arise for many years. Yet we should press ahead with exploration, so that Canadians will know that a secure source of oil and gas is available as our "safety net" for the future.

Can such a principle be reconciled with exports of northern oil and gas? Clearly, the private sector's exploration effort has been founded on an expectation that resources, once discovered, will be produced as soon as possible. Such perceptions, based on legitimate individual company interests, may have to adapt somewhat, to be consistent with the safety net approach. In large measure, the rationale for generous financial support by Canadian taxpayers and consumers rested upon a desire to provide for future generations.

Canadians—as owners of the Canada Lands, and as taxpayers—have a real stake in decisions about oil and gas development. Many Canadians are understandably sceptical about assertions that Arctic resources should be produced quickly for export, as if energy were a commodity like any other. If energy were an ordinary commodity, Canadian taxpayers would never have supported provision of the rich incentives that have been available to the petroleum industry. Canadians would want to be sure, in the event that any of these reserves were judged surplus to domestic needs, that broad social and economic benefits justified their sale to others. The Government of Canada recognizes these concerns and will be very demanding in its assessment of export proposals. It wishes to leave no illusion about its top priority—improving Canada's oil supply-demand balance.

Northern exploration also raises particular environmental and social issues. Companies operating there have been sensitive to these, and continued vigilance will be required. When commercial development is undertaken, particular care will be paid to environmental questions.

As well, there will have to be assurance that the interests of the residents of this region are protected, and that they have the opportunity to play the role they desire in these activities. The native residents of the region seek—legitimately—more say in the decisions affecting energy development, and claim—rightfully—that they should enjoy more of the benefits, and fewer of the costs, from northern resource activity. The Government of Canada, on its own and through its instruments governing private sector activity, will respond to these concerns. The need for frontier resources, given the other options that Canadians can proceed with, is not so great that it must override our social goals and obligations.

New Legislation

The legal framework now governing oil and gas activity on the Canada Lands is inadequate. Many of the provisions of the land regulations were established nearly 20 years ago, at a time when the world energy situation was much different, and when the potential of the Canada Lands was not fully appreciated. A fundamental restructuring of these rules is needed, to reflect current realities. The National Energy Program includes new legislation to provide a modernized regulatory basis for the management of these lands.

Oil and gas rights have already been issued with respect to the bulk of the areas currently considered as prospective by the petroleum industry. The Government of Canada will establish a new regime for these lands, which will serve new policy objectives and establish the certainty of tenure necessary for a stable investment climate.

The principal objectives of the new regime will be to:

- *Ensure active development of oil and gas rights.* The Canada Lands are increasingly attractive. Important discoveries have already been made, and numerous promising geological structures remain to be

What is the Progressive Incremental Royalty?

The Progressive Incremental Royalty is a revenue-sharing scheme that comes into play when a company develops a very profitable find on Canada Lands.

Under this system, the holder of a federal Production Licence pays the Crown a basic 10% royalty, plus 40% of the net annual profit derived from the oil and gas produced from his licence above a 25% "floor" rate of return.

The annual profit is based upon revenues net of operating costs, basic royalty paid, and allowances for investment and income tax paid.

What is an Exploration Agreement?

An Exploration Agreement is, in essence, a contract negotiated between the Government of Canada and a petroleum exploration company with respect to the oil and gas rights to an area of Canada Lands. It is designed to cover the exploration and development phases up to the point where a commercial discovery has been declared and a Production Licence is issued.

An Exploration Agreement is normally entered into after the submission of proposals following a call for public tender. The Minister has discretionary power to negotiate final terms and conditions after bids have been opened and ranked.

In deciding whether to award an Exploration Agreement, the Minister may take into account any factors considered appropriate in the public interest, including the extent of equity participation by Canadians and the employment of Canadians and of Canadian goods and services.

The holder of an Exploration Agreement has the right, subject to the existing legislative-regulatory regime, to explore for and develop oil and gas on the lands under the Agreement. He has the exclusive right to drill on those lands and to obtain a Production Licence should he make a commercial discovery and meet the necessary requirements, including those pertaining to Canadian ownership.

What Provisions Are Made for Environmental Protection in the Canada Lands?

The 1970 *Oil and Gas Production and Conservation Act* embodies extensive provisions for pollution prevention, and for remedial measures if pollution does occur.

The Act now empowers the Chief Conservation Officer to shut down operations "to prevent damage to persons or property or to prevent pollution" and "to take over the management and control" of operations and charge costs to the rights holder.

Proposed amendments to the Act will reinforce these powers and make the mineral rights holder absolutely liable, without proof of fault or negligence, for costs and expenses incurred in taking remedial measures to stop and clean up an oil spill as well as for loss and damage suffered by others as a result of the spill.

The new legislation for the Canada Lands makes oil and gas rights available for development and hence is not directly concerned with pollution prevention *per se*. However, there will be provisions to establish a Fund to cover costs of regional environmental studies related to oil and gas activities. This Fund would be raised by assessing holders of oil and gas rights proportionately on an acreage basis (site-specific environmental studies are carried out by operators during the normal course of events as a pre-requisite for approval of specific work programs). Provision is also made for catch-up assessments on parties acquiring oil and gas rights in a region where environmental work has already been financed.

tested. In return for the privilege of rights to these lands, vigorous and sustained exploration and development efforts should be expected. This has not always been the case, in part because of lenient work requirements under existing provisions. This is no longer appropriate, especially in the context of Canada's energy security goals. A main feature of the new system, therefore, will be stiffer work requirements, to be negotiated through Exploration Agreements. Other means will include drilling orders, production orders, prior approval of transfers and assignments and, in certain cases, the designation of Petro-Canada as operator.

- *Reserve to the Crown a 25 per cent interest in every right on Canada Lands.* This interest will be exercised by Petro-Canada or some other designated Crown corporation, and will be in the form of a carried interest, convertible to a working interest at any time prior to the authorization of a production system for a particular field. It will be applicable to all existing interests, however acquired.
- *Increase Canadian ownership.* A minimum of 50 per cent Canadian ownership—private or public sector—will be required for any production from Canada Lands.
- *Ensure that a high level of Canadian goods and services is employed in oil and gas activities carried out on Canada Lands.* Applicants for exploration and production rights will have to demonstrate how their operations will bring industrial and employment benefits to Canadians, both in the region of interest and elsewhere in Canada. Where applicable, companies will be expected to put in place special training and employment measures, particularly for native Canadians.
- *Ensure that Canada receives a fair share of the economic rent.* In addition to a basic royalty of 10 per cent, a Progressive Incremental Royalty will be established, based on the profitability of each producing field.

The new system implies a major change in the Canada Lands regime, one that is consistent with national objectives. However, some companies may take exception to more stringent work requirements, and to the privileges accorded Crown corporations. This would be a short-sighted view—one that does not recognize how favourable the overall regime would remain by world standards, and how attractive the Canada Lands have become. Some companies may nonetheless decide to relinquish their holdings rather than accept the obligations. Should this occur, early action would be taken to ensure that the lands in question are made available to firms that are willing to pursue active programs on them. On balance, therefore, the new legislation should make a substantial contribution to supply development.

The legislation will also permit Petro-Canada or another designated Crown corporation to act more vigorously as a catalyst and leader in project

development. The Government of Canada intends that its Crown corporations will play an active role on Canada Lands. The new incentive payment of 25 per cent of approved exploration costs on Canada Lands, available to any investor, reflects an understanding on the part of the Government that in return for its direct participation in the industry's efforts wherever they occur in the Canada Lands, there should be a commensurate Government contribution to the costs of that activity.

The *Oil and Gas Production and Conservation Act* will also be amended, to strengthen existing provisions for the supervision and control of oil and gas activities in the interests of safety and the prevention of pollution.

Among the changes will be more rigorous requirements for environmental protection, particularly as regards responsibilities of operators, and their absolute liability in case of pollution-causing accidents; and the responsibility of operators for the costs of evaluating production systems.

For a Truly Canadian Industry

The Canadian oil and gas industry has historically benefitted to a substantial degree from the availability of foreign risk capital invested by the major multi-national oil companies. These companies also brought important technical skills to this sector. Continuing foreign inputs will be of value to Canada, and those firms demonstrating responsiveness to Canadian interests and objectives will continue to play a major role in the energy sector.

At the same time, greater Canadian ownership of the oil and gas industry in this country is a clear objective of the Government's policies. It is time that more of the considerable increase in the value of Canada's petroleum reserves, occasioned by international events, accrued to Canadians.

On the technical side, Canada has a sophisticated talent base. Furthermore, many of the challenges of future energy developments are somewhat unique to Canada—oil sands development and operations in ice-infested frontier waters, for example. Technical advances in these and other areas will have to be paid for by the value of the Canadian resources involved, regardless of which companies undertake the work, and it is only fair that the benefits of the activity and know-how associated with such efforts accrue to Canadians.

The industrial spin-off to which the anticipated investments in oil and gas exploration, development and transportation give rise must likewise be made to occur in Canada. It would be a serious error to miss the broader opportunities that the Canadian energy resource boom, already well underway, should support.

The Government of Canada believes that the oil and gas sector is a unique case, and that special measures—not required in other sectors—are needed to ensure more Canadian control. Thus the National Energy Program contains a number of measures designed to increase Canadian participation.

Moreover, the Government believes that its Canadianization objectives, far from conflicting with its security and fairness goals, are integral to them. A more fully Canadian industry is likely in the long run to build a more

dynamic energy sector, more responsive to Canada's goals. A truly Canadian industry, in which Canadians across the country have a stake, will produce a fairer sharing of the benefits of Canada's rich resources.

The Government is concerned about ownership trends in the non-petroleum energy sector. The problem is less severe in this area, but Canadians would not be wise to let the pattern of ownership that occurred in the oil and gas industry repeat itself in the uranium and coal industries. In the uranium industry, the Government will continue to insist on a Canadian ownership level of at least 67 per cent. The Government is anxious to ensure that the coal industry does not become dominated by foreign-controlled firms. It has already indicated that any coal liquefaction plants will have to meet a Canadian ownership test.

The situation in the oil and gas sector, however, requires fundamental change. The Government of Canada is committed to a significant shift in the structure of the oil and gas industry. It has three goals:

- At least 50 per cent Canadian ownership of oil and gas production by 1990;
- Canadian control of a significant number of the larger oil and gas firms;
- An early increase in the share of the oil and gas sector owned by the Government of Canada.

The Government's Canadianization goals include both ownership and control targets. Both are important. Because of the large wealth transfers to this industry that are likely to occur, the Government is concerned about the ownership of the industry. A target of 50 per cent ownership of the industry by 1990 has been set. If this is to be achieved, a major shift must occur. This implies rapid development of existing Canadian firms and in some cases an increase in Canadian shareholding in foreign-controlled firms.

Ownership targets, however, are only part of the answer. It would not be sufficient if all the major oil and gas firms sold only enough of their shares or assets to Canadians that the 50 per cent target was achieved. Canada's oil and gas industry would still be dominated by foreign-controlled firms. The Government of Canada seeks a much healthier situation in which there is a more balanced mix than at present between publicly owned firms, privately owned and Canadian-controlled firms, and foreign-controlled firms. Thus, the goal of the Government is to increase the proportion of the oil industry owned by Canadians, through their national government, by acquiring several of the large foreign-owned firms. Moreover, the Government wishes to encourage a process whereby private Canadian firms acquire some of the foreign-controlled oil and gas companies.

The National Energy Program contains a number of measures designed to meet these goals. A set of policies has been developed to encourage Canadian firms in the sector to expand and to grow, to encourage Canadians to

enter this sector either through acquisitions or new exploration, and to open up new opportunities on lands under federal control.

As noted earlier, payments through the Petroleum Incentives Program will now be available to help firms that are owned and controlled by Canadians. These payments will reduce the cost of investment to firms that meet the ownership and control criteria, and provide a powerful incentive for Canadian firms to get on with the job of finding oil and gas. Canadian individuals, too, will be encouraged to invest in the oil and gas search, through provision of new incentives.

The changes to earned depletion and the establishment of an incentive payment system geared to a Canadian ownership and control test will remove one of the biases in the current tax system, and will encourage firms to adjust their ownership levels. The creation of the Natural Gas Bank will aid the small Canadian firms and help maintain the momentum of the search for new oil and gas.

The National Energy Board will be asked to take Canadian ownership levels into account, from now on, in considering export applications. The Government of Canada would prefer that in granting such licences, the Board would give preference to Canadian-owned and Canadian-controlled firms. The Government will also examine closely groups applying for the non-conventional oil reference price, to ensure that the pattern of ownership in new large non-conventional projects is consistent with the Government's goals.

In developing an energy program designed to ensure greater Canadian participation, the federal government must ensure that Canadians play an active role in the lands under its own control. For this reason, the new legislation for the Canada Lands will require a 50 per cent ownership test at the production stage in the Canada Lands. Control over the land on which exploration takes place is critical to the ultimate ownership of new production. At present the foreign-controlled firms own much of the land in the provinces. Provisions similar to those adopted by the federal government would, if adopted by the provinces, make a major contribution to the achievement of the Canadianization goals.

The *Foreign Investment Review Act* (FIRA) will also continue to play a key role in ensuring the Government's Canadianization goals. Firms that are foreign controlled will continue to be non-eligible firms for FIRA purposes. Moreover, the Foreign Investment Review Agency will vigorously enforce its investment criteria in the energy sector. The Government does not want to see the oil companies use their cash flow to expand into the non-energy part of the economy. Nor does it want foreign-controlled firms to buy already-discovered oil and gas reserves.

These programs will ensure that both large and small Canadian firms play a more active and growing role in the oil and gas sector. By themselves, however, they may not guarantee full realization of our ownership goals. In the absence of other policies, the largest firms in the oil and gas sector would continue to be foreign owned and foreign controlled. While Petro-Canada would

grow, the public sector would still remain quite small. The average Canadian would have no vehicle through which to participate in this sector. The Government believes that a larger national public sector presence in oil and gas is the only equitable way to meet quickly our goal of increased Canadian ownership. Judging from the results achieved to date by Petro-Canada, it is also an effective way of encouraging the rapid energy development necessary to meet our security needs.

For these reasons, the Government of Canada intends to acquire several of the large oil and gas firms.

In adopting a program of enlarging the public sector, the Government is anxious to ensure that the program is self-financing, and imposes no additional burden on general Government revenues. Therefore, the Government will establish a *Canadian Ownership Account*, to be financed by special charges on all oil and gas consumption in Canada, to be used solely to finance an increase of public ownership in the energy sector. The charges will be set at levels that make this program totally self-financing. The actual rates and the dates of implementation will be determined by the progress of the acquisition program. The charges will be kept at moderate levels in the early years, to limit the impact on consumers.

While the Government of Canada is determined to increase Canadian ownership and control, it does not wish the result to be increased concentration of power in the hands of a few large Canadian companies. Competition is the lifeblood of the industry, and the consumer's best protection. A concentrated Canadian industry is an unsatisfactory replacement for a concentrated foreign-owned industry. The intent of the Program is to *increase* the number of Canadian participants. Therefore, the Government will be vigilant about ownership trends in the industry. The Petroleum Monitoring Agency will play a key role, through its function of advising Parliament on the size, financial position and ownership of the oil companies.

What is the Petroleum Monitoring Agency?

The Petroleum Monitoring Agency was established in August 1980 to monitor and report on the activities and financial performance of the petroleum industry in Canada. It is proposed that the *Petroleum Corporations Monitoring Act* would be amended to confirm the Agency's mandate, so that it can continue to carry out its duties and provide advice to the Minister of Energy, Mines and Resources. It will also provide independent comment on information that is essential to the Government's energy strategy and to the public's understanding of energy issues.

The Petroleum Monitoring Agency will also establish the Canadian ownership rates necessary, for example, to determine whether a firm is eligible for payments under the Petroleum Incentives Program.

The Agency will receive information secured under the *Petroleum Corporations Monitoring Act* concerning costs of production, profitability, research and development efforts, and reinvestment behaviour. It will also monitor and report on ownership and control in the industry. The Agency will issue reports on a regular basis that will permit the Government and the Canadian public to be assured that the revenues resulting from higher oil and gas prices are being used in ways that enhance Canada's energy security.

Nor does the Government intend to encourage monopoly in the public sector of the industry. To ensure competition in the public sector, the Government may establish one or more new Crown corporations to hold the assets acquired, rather than adding them all to Petro-Canada. Petro-Canada will remain a principal direct policy instrument of the Government of Canada in the energy sector, and it may be that some of the assets acquired will be transferred to Petro-Canada, to strengthen its capacity to perform this role. Nevertheless, it is the Government's view that if all the firms acquired were to be incorporated within Petro-Canada, its effectiveness as an instrument of Government policy would be reduced, rather than strengthened.

The Government of Canada recognizes that the National Energy Program represents a fundamental departure, in many instances, from the current policy environment. Despite the fact that the policies will maintain, even enhance, the relative position of the oil and gas industry, some firms may regard the new conditions as unsatisfactory. The Government's acquisition program provides an answer for them. The Government of Canada is a willing buyer, at fair and reasonable prices.

The ownership and control targets for large firms and public sector participation are voluntary. It would be preferable to meet the ownership targets by guidelines and flexibility, rather than through legislation. The Government will, however, carefully review developments, to see whether satisfactory progress is being made under these voluntary ground rules.

The Government of Canada will meet with all of the major foreign-owned firms immediately to discuss the manner in which they intend to support the achievement of the new objectives. In some cases—where, for example, the Canadian ownership is now quite small—acquisition by the federal government or a private Canadian concern may be the most suitable route.

Petro-Canada will act as the agent of the Government of Canada to acquire the additional firms. Once significant progress has been made on the acquisition program, the Government will direct Petro-Canada as to the disposition of the assets acquired. There will likely be a small addition to Petro-Canada's asset base to round out the activities in which it is engaged, in order to ensure that Petro-Canada is involved in all aspects of Canada's oil and gas industry. Depending on the size and nature of the assets acquired, the remaining assets will form the basis for one or more new Crown corporations.

Helping the Developing Countries

The strength of Canada's energy picture is in contrast to the weakness of many other countries. This is particularly true of the less developed countries. They have been hard hit by OPEC price increases. Yet, paradoxically, there is a large energy potential, including oil, in many of these countries. Financial, institutional and technical skills constrain the rapid development of these resources.

Canada has an interest in seeing this logjam broken. Our vulnerability to the world economic slowdown which has accompanied the world oil crisis

gives us a keen interest in helping to solve this problem, as part of an international effort to solve the world's oil problem. Moreover, Canada has the skills to help solve it and, in doing so, can open up industrial and trade opportunities to strengthen our own economic growth.

Petro-Canada will, therefore, launch a major new initiative to help developing countries. A new firm, *Petro-Canada International*, will be created to explore solely in developing areas, where multi-national oil companies are often reluctant to invest. This company will harness the skills of many private sector firms in Canada for the benefit of developing countries. The company will also seek joint-venture opportunities with other state-owned oil companies in the western world. Preliminary discussions have already taken place with the state oil companies of Mexico and Venezuela, in connection with a major joint effort to assist petroleum development in Latin America and the Caribbean.

Some $250 million has been allocated for this initiative, including $50 million "seed money" for equipment acquisition and start-up costs.

Direct Action Programs

The achievement of a suitable oil price and fiscal regime is the necessary point of departure for a national energy policy. In itself, however, it will not solve all of Canada's energy problems. For this reason, the Government of Canada has developed further reinforcing initiatives. These will complement programs already established by the federal government and the provinces.

The principal thrust of these initiatives will be to reduce quickly our oil imports, while seeking the energy answers Canada needs to make its longer term choices. Canada, along with the other countries of the IEA, has committed itself to strong efforts to reduce oil imports. Better than most other countries, Canada has the potential and resources to achieve oil independence.

The means to achieve this goal are of three kinds:

- Exploration, development and production of domestic oil supplies;
- Reduced consumption of oil products, as part of a rapid improvement in the efficiency of energy use; and
- Rapid substitution from oil to more plentiful Canadian energy sources.

To sustain Canada's energy security in the long run, vigorous efforts will be needed to reduce energy consumption, and develop alternative, sustainable, forms of energy supply. The National Energy Program reinforces the federal conservation program. At the same time it launches new initiatives in research, development and demonstration to secure energy options for Canada in the coming decades.

Substitution Away from Oil

While no country can be complacent about the energy outlook, and while the need to use energy wisely is a national, as well as an international imperative, Canada's problem is not one of energy shortage. On the contrary,

we are major net exporters of energy, and have the resource base to play that role for some time. However, Canada does have one serious energy problem—a growing dependence on oil imports. This situation is analogous to an individual who worries because of an overdraft in one bank account, while maintaining a surplus of an even larger amount in another account. The sensible course of action for that individual is obvious: move some resources from the surplus account into the other account.

In energy terms, this is what Canada must do, and can do. Oil is our most immediate and pressing problem; other energy sources represent a large part of the solution. For this reason the National Energy Program establishes the basis for a truly dramatic shift in Canada's pattern of energy use—away from oil, toward gas, electricity, renewable energy and coal. This "off-oil" conversion program, therefore, is a cornerstone of the drive towards independence from the world oil market within the decade.

Generations of Canadians have come to consider reliance on oil to heat their homes, power their factories, and fuel their cars, as the normal way of doing things. This perception, perhaps justified in a period when oil was cheap and abundant, must change to take account of new realities. Canadians must switch now to more plentiful and less expensive alternatives. This need not force an acceleration of the development of these other sources. Even if substitution were the sole means of replacing oil imports, there would still be an energy surplus, in aggregate, for some time.

Some parts of Canada are already using fuels other than oil to meet most of their energy needs, at least in the non-transportation sectors. On average in the Prairies, oil provides only about 10 per cent of the energy used to heat homes and run businesses and factories. The goal of the National Energy Program is:

- *To reduce the use of oil in each of the residential, commercial and industrial sectors in every province to no more than 10 per cent of total energy used in those sectors.*

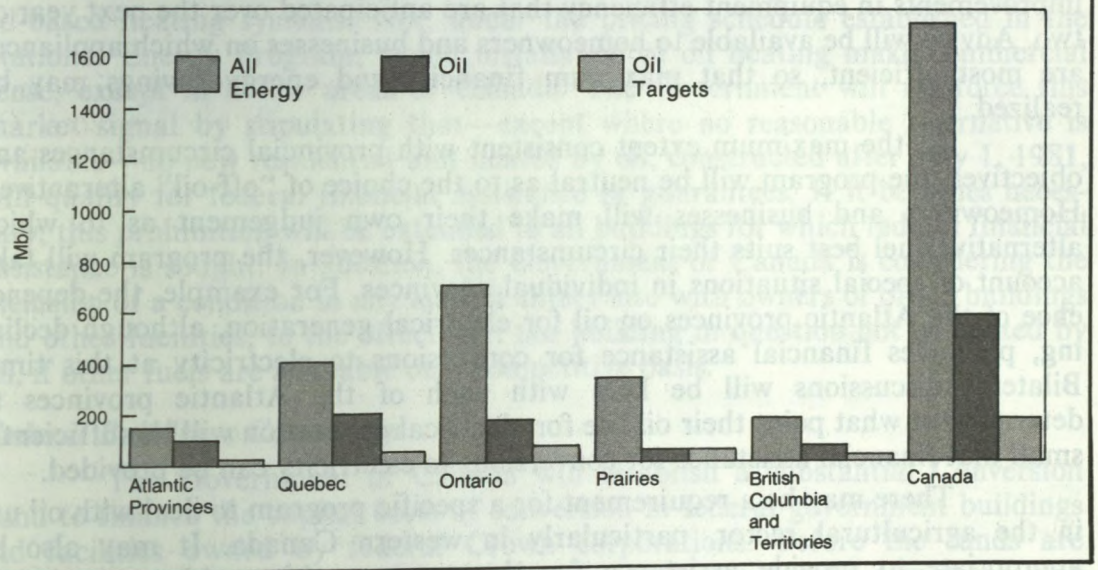
If this goal were achieved tomorrow, Canadians would be using 390,000 barrels a day less than they now do. This amount of oil is nearly equivalent to our total oil imports today, and more than one-half the level of imports projected, under previous policies, in 1985. Put another way, it is equivalent to the output of three Syncrude-scale oil sands plants.

There is no technical or economic reason why this target could not be achieved, and achieved quickly. The Government of Canada has discussed the Program with provincial governments, the utilities involved, major conversion equipment suppliers, and some industrial firms now using oil. There is general agreement that, with close co-operation and careful management, the goals can be achieved in an effective, timely, and fair way. While there could be temporary bottlenecks, due to pressures on equipment and utility manpower, all concerned have a strong interest in resolving these as quickly as possible. The conversion program will help us meet our energy objectives; it also means substantial new opportunities for economic growth and employment across the country.

With successful completion of the 10 per cent program, oil will be used primarily in the transportation sector. Further major reductions in Canada's use of oil will come only by halting, and then reversing, the growth in demand for oil by this sector.

However, major progress in the transportation sector will require either rapid improvement in the efficiency of engines using fuels derived from oil, or a major replacement of oil by alternative fuels. Many technological and economic unknowns remain. Some options appear more certain and more economically attractive than others, and the Government of Canada will provide new incentives for their use. There may well be other solutions, made viable by new oil price realities. The Government has recently published a comprehensive survey of the liquid fuel options available to Canada. It is anxious to encourage public discussion of these options, and will be sponsoring seminars to discuss them. In parallel, it will be examining how best to accelerate further the process of bringing on new, viable, alternatives to gasoline. It will assign new priority, and additional funds, to federally-sponsored research and development of liquid fuel options.

The 10 Per Cent Target and 1978 Non-Transport Secondary Energy Demand



Conversion Incentives

Under the National Energy Program the price of oil will rise to levels that make other fuels attractive on grounds of price alone. However, there are still obstacles to a rapid substitution effort. Many households, for example, will have to incur costs of $1,000 or more to replace an old oil-burning furnace with an efficient gas furnace. Even though this would represent an attractive investment, many families will hesitate, for lack of ready cash. It is in the

national interest that the process be accelerated. Therefore, generous financial help will be provided to reduce this cash-flow barrier.

The Government will seek agreement with the provinces for the implementation of a program of incentives to assist homeowners and businesses to convert from oil. While details of the program may vary among provinces, the core program envisages grants to consumers to help cover their costs of conversions:

- *For conversions from oil to gas, electricity, renewable, and other energy sources, a grant of 50 per cent of the conversion cost, up to a maximum of $800.*

For gas and electricity, the grant program will be administered by the utilities concerned. Programs for conversions to other fuels will be administered under arrangements with provincial agencies or private sector entities.

Taxpayers will be required to include the amount of these grants in their income for tax purposes, as is currently the case for grants under the Canadian Home Insulation Program.

The federal government is particularly anxious that individuals be aware of the high efficiency equipment that is now available and of the improvements in equipment efficiency that are anticipated over the next year or two. Advice will be available to homeowners and businesses on which appliances are most efficient, so that maximum financial and energy savings may be realized.

To the maximum extent consistent with provincial circumstances and objectives, the program will be neutral as to the choice of "off-oil" alternatives. Homeowners and businesses will make their own judgement as to which alternative fuel best suits their circumstances. However, the program will take account of special situations in individual provinces. For example, the dependence of the Atlantic provinces on oil for electrical generation, although declining, precludes financial assistance for conversions to electricity at this time. Bilateral discussions will be held with each of the Atlantic provinces to determine at what point their oil use for electrical generation will be sufficiently small that financial assistance for conversions to electricity can be provided.

There may be a requirement for a specific program to deal with oil use in the agricultural sector, particularly in western Canada. It may also be appropriate to provide assistance for those communities without access to natural gas and which are not served by the main electrical grid. These situations will be discussed with the provincial governments.

Many commercial and industrial firms continue to use oil even where gas is now available. This is a waste of a scarce commodity. The Government of Canada is determined to end this unnecessary use of oil. It will establish programs to increase the availability of gas. It has also launched a number of other initiatives to reduce dramatically the production of heavy fuel oil, the major form in which oil is used commercially and industrially. If necessary, it

will take other steps to ensure that this occurs. In most areas, therefore, heavy fuel oil will not be readily available after 1985, and firms now using it will have to convert to other fuels.

The Government is anxious that this conversion process be brought about as quickly as possible. These conversions are commercially sensible decisions, having in mind the relative price of natural gas. Therefore, oil-using firms should not delay in making the necessary changes.

The program to assist consumers to convert away from oil will require the co-operation of the provinces and the local utilities. The objectives of the program are consistent with provincial goals. Energy departments and agencies in most of the provinces have already been consulted and are supportive of the program. Still, it will take several months for full details of the program to be developed. Payments under this program will not be made until early in the new year. However, all consumers converting after October 28, 1980 will be eligible for the program. Those making conversion investments should save their receipts. When the program is operational, compensation will be paid. No one should delay action to convert away from oil.

Having made this massive commitment—about $650 million over the next four years alone — to substitution in *existing* buildings, the Government of Canada would be most reluctant to see *new* building construction include oil-based heating systems. Nor, under the pricing schedule established in the National Energy Program, would installation of oil heating make commercial sense, except in a few areas of Canada. The Government will reinforce this market signal by stipulating that—except where no reasonable alternative is available—no new residential unit heated by oil, constructed after July 1, 1981, will qualify for federal financial assistance or guarantees. If it becomes necessary, this prohibition will be extended to all buildings for which federal financial assistance is sought. In addition, the Government of Canada is considering the inclusion of a condition in any lease it enters into with owners of office buildings and other facilities, to the effect that the building in question not be heated by oil, if other fuels are available on a competitive basis.

Federal Buildings Conversion

The Government of Canada will establish a substantial Conversion Fund to finance the capital costs of conversion in federal government buildings and facilities owned by federal Crown corporations. Before the funds are disbursed, audits of oil consumption in these buildings will be completed, and the necessary conservation measures taken, so that the conversion funds may be used in the most cost-effective way possible. It is hoped that provincial governments and municipalities will initiate similar actions, where they have not already done so.

Pipeline Extensions

Many areas of Canada are still not served by natural gas, and consequently have no opportunity to substitute natural gas for oil. It is essential

for achievement of the 10 per cent oil use target that the present Canadian gas transmission and distribution system be extended. It is expected that natural gas service will be extended to Vancouver Island. Also, the Government has recently accepted the recommendation of the National Energy Board that the application to extend the gas pipeline system beyond Montreal to Quebec City be approved. As described more fully in the section on Atlantic Canada, the Government wishes this pipeline to be extended into the Maritimes.

The natural gas pricing arrangements outlined earlier in this document should ensure the financial viability of new transmission systems in eastern Canada. Pipeline sponsors and gas distribution companies can be assured that city-gate prices in new market areas will not be higher than the Toronto city-gate natural gas price, which itself will be significantly lower than the equivalent oil price. This pricing policy will allow gas marketers to easily penetrate new areas, and should lead to rapid increases in gas deliveries through the new pipelines.

The Government of Canada is determined that the new transmission system eastward of Montreal proceed as rapidly as possible. There should be no uncertainty as to the Government's intentions in this regard. If necessary, the Government will take direct action to remove financial bottlenecks, with the objective of making gas available in the Maritimes in 1983.

The Government of Canada will set aside up to $500 million, to be used if required, to support both the eastern Canada system extension and the new line to Vancouver Island. The precise form, if any, of the federal government's involvement will be decided following consultation with the interested parties. With this initiative, natural gas will become available in all major areas of Canada where it is economically feasible.

Expansion of Energy Distribution Systems

Building the main transmission lines to assure all regions have gas is only part of the answer. Gas lines must then be extended from these lines to reach individual customers. The natural gas pricing policy of the National Energy Program will make this economical. Gas delivered in the transmission lines will be much cheaper than oil. Distributors will be able to pay the costs of expanding their lines and still deliver gas to customers at prices that make it cheaper than oil.

However, some distributors might be hesitant to proceed as aggressively as needed, because system expansions would raise costs of the total system and, therefore, the cost of gas to all consumers. To overcome this, and to provide a general inducement to vigorous action, the Government of Canada will offer market-development bonuses to ensure that expansion proceeds rapidly. This offer will be conditional, in each province, upon a commitment by the provincial government to the 10 per cent oil share target, and agreement that the gas price

incentive be used in part at least to pay for system expansion, rather than simply passed on to existing gas consumers, who already enjoy relatively low prices compared to oil users.

The federal government has played an important role in assisting the development of electrical generation and transmission facilities in Canada. Examples of federal involvement include extensive support of provincial electrical research and development such as the $25 million contribution to the demonstration of low-head hydro power at Annapolis, Nova Scotia, a commitment to provide up to $193 million in loans at Crown corporation rates, of which over $100 million has been spent to date, for transmission facilities from the Nelson River development in Manitoba, joint involvement with the Newfoundland government to study the hydro-electric potential of the lower Churchill River in Labrador, funding 50 per cent of the cost of inter-provincial inter-connections through loans at Crown corporation rates, and federal funding of up to 50 per cent of the cost of the first nuclear reactor in a province, including the Gentilly reactor in Quebec and the Lepreau plant in New Brunswick. Federal government support to the electricity sector will continue under the National Energy Program.

In most provinces, the provision of electricity is the responsibility of provincially-owned corporations, whose mandate generally is to provide electrical service to provincial residents who seek it. These corporations, in most provinces, will have a major role to play in the off-oil substitution effort. In large measure, their efforts to connect new customers switching from oil heat should be self-financing. In other cases, there could well be scope for some financial contribution by the provincial government. There might, however, be some cases where a federal contribution—analogous to the assistance given to gas distributors—could be warranted.

Consideration is also being given to providing financial assistance for propane distribution or storage facilities, where this would demonstrably facilitate the conversion process.

Alternatives to Gasoline

The process of converting from gasoline to other fuels is proceeding too slowly in Canada. Yet there are alternatives on the scene now, and others are emerging.

In many areas propane, a clean-burning and efficient fuel, is readily available, and the technology for conversion of motor vehicles is well known. Thus, there is a good basis for rapid substitution. While the National Energy Program provides incentives to use propane for space heating, by no means all of the propane available will be required for this purpose. There should be substantial amounts available for transportation uses in several areas of the country.

Propane is not in surplus in all regions. It is produced mainly in the western provinces, although a substantial share of this production is moved by

pipeline to Ontario. In addition, significant amounts are produced by eastern Canadian refineries. It is likely that most vehicle conversions will take place in Ontario and the west. A number of enterprising firms have already begun to convert their fleets.

The number of outlets for propane is limited, and will remain so in the early stages of propane growth in vehicle fuel markets. This may not be convenient for the average motorist. However, fleet operators, particularly those whose fleets operate within a limited distance from home base, could readily establish or have ready access to a central propane distribution point. Logically, therefore, the earliest conversion would be in fleets—taxis, utility trucks, delivery vans and so on. Also, it is most efficient to convert first those vehicles that are likely to use large quantities of fuel in a year. Again, commercial vehicle fleets are among the most attractive candidates from this point of view. Thus, the National Energy Program is providing incentives for the conversion of commercial vehicle fleets to propane.

Some provincial governments have already acted to support expanded use of propane and other fuels instead of gasoline. The Government of Canada is providing further encouragement through a conversion grant program for commercial vehicles, and by setting an example with its own vehicles.

For commercial fleets, *taxable grants of up to $400 will be provided for each vehicle converted to propane.* The grant program will be used to encourage conversions under current propane marketing conditions, and will be reviewed once an acceptable rate of conversions has been achieved. The federal government will convert its own vehicles to propane wherever practicable, with a target of at least 8,000 propane vehicles over the next five years.

The Government is also interested in the potential to use compressed natural gas (CNG) as a motor fuel in Canada, and is anxious to encourage the development of this newer option. CNG is not as well developed as propane in Canada, and differs from the propane option in several ways: the supply of CNG and supporting infrastructure is not available in Canada today. We lack

Some Provincial Actions to Promote Alternative Transportation Fuels

Ontario:

- Eliminated retail sales tax on vehicles powered exclusively by electrical energy, hydrogen, propane, natural gas, manufactured gas or alcohol, required to be licenced under the *Highway Traffic Act.*

- Under the *Gasoline Tax Act*, exemption provided for

  - Alcohol when used alone or when blended with another fuel for the purpose of generating power by means of internal combustion; and

  - All natural and manufactured gases, including propane, in all uses.

Manitoba:

- Removed road tax from gasohol containing at least 10% alcohol.

British Columbia:

- Eliminated the provincial Social Services Tax on propane converter kits for motor vehicles.

- Has a road tax for propane which is lower per gallon than that for gasoline.

experience, in Canada and world-wide, with the technology of CNG. The number of fleets appropriate for CNG conversion seems smaller. Safety regulations must be co-ordinated and improved before they can support a significant scale of CNG motor fuel use in Canada.

Because of these differences, the grant program will not apply immediately to CNG, but the development of this option is to be encouraged through a number of other programs in which CNG will be accorded priority. In particular:

- Research on CNG compressor technology and storage containers is to be given a high priority in the Government's research and development program on alternative fuels.
- An industry-government working group will be formed to develop safety codes for CNG use.
- Large fleets that appear ready to demonstrate the conversion of vehicles to CNG and the provision of necessary fuel facilities will be supported through the existing Federal-Provincial Energy Demonstration Agreements and, as necessary, directly by the Government of Canada.

These efforts should provide information at an early date on which to decide whether a grant along the lines of the propane conversion incentive would be the best way to encourage this potentially major option, or whether other avenues of support should be explored—not only for CNG, but for a range of new non-oil fuels. The Government of Canada assigns high priority to these investigations.

These new incentives and actions should be ample signal to Canadian entrepreneurs in the conversion equipment industry. They should gear up for expanded production, so that the industrial benefits of conversion from gasoline are maximized.

Improving the Efficiency of Crude Oil Use

Refinery Modifications

The oil refining industry has served Canada well. However, major changes are now required, if the goals of the National Energy Program are to be achieved. Canada has to use its scarce crude oil more efficiently.

Refineries in eastern Canada were designed to use relatively light crude oils, and to process these into a range of products including, in many cases, a large proportion of heavy fuel oil. This found ready markets in Canada and, often, in the United States.

However, heavy fuel oil could be reprocessed in a suitably designed refinery to produce higher-value products such as gasoline. In a very real sense, this low-grade product is another source of crude oil for Canada. Moreover, there is very little need in Canada for heavy fuel oil. Substitutes such as natural

gas and wood wastes are readily available to many firms now using that product. Continued production of heavy fuel oil, and the need on the part of refiners who cannot reprocess it to get rid of it, represents a major barrier to the process of substitution away from oil. Not only are we wasting precious crude oil by downgrading it into low-value products, we are unnecessarily blocking achievement of the 10 per cent oil use target.

A major element of the National Energy Program is the modification of existing refineries to reduce to a technical minimum the production of heavy fuel oil in Canada. This process is already under way. Profit margins in the refining industry are healthy, and the commercial return on products such as gasoline should provide the necessary incentive.

Petroleum Refining

A refinery derives petroleum products from crude oil by subjecting it to a number of physical and chemical processes. The different hydrocarbon components, or *fractions*, of crude oil have different boiling ranges. These components are broken-out in *fractional distillation* by heating crude oil to a temperature that vaporizes all of the components except for heavy oils, or "residual". The vapourized petroleum enters a fractionating tower in the form of a mist. Vapours rise up the tower, which becomes progressively cooler at higher levels. The different fractions cool and condense at different temperatures at different levels in the tower.

The fractions may be broadly classified, in order of descending volatility, into four main groups:

- *Gases* that are recovered at the top of the tower consist mainly of methane, ethane, propane and butane;
- *Light distillates*, including automotive and aviation gasoline and naphtha;
- *Middle distillates* that are used as kerosene, diesel fuel, jet fuel and furnace oil; and
- *Residual products* or the "leftovers" of the refining process, which include heavy fuel oil and asphalts.

The product yields from a refinery depend on both the type of crude oil supplied to it and the refining process employed. Generally, the heavier the crude oil—and crude production is becoming heavier world-wide—the smaller the proportion of light refined products and the greater the yield of residual.

To upgrade residual oil products, conversion refineries use techniques known as catalytic cracking and hydro-cracking. In catalytic cracking, some of the heavier components from fractional distillation are broken down to produce more gasoline, light fuel oils, and feedstocks needed to produce petrochemicals. Hydro-cracking yields high quality products from heavy oil through a process that involves simultaneous cracking and additions of hydrogen under high pressure.

Output from Canada's 37 operating refineries averaged 1,980 Mb/d in 1979. The yield was in these proportions:

Products	*Output*	*Yield*
	(Mb/d)	(%)
Gases, LPG	97	4.9
Petrochemical feedstocks	91	4.6
Gasoline	686	34.7
Aviation turbo fuel	83	4.2
Kerosene, stove oil and tractor fuel	32	1.6
Diesel fuel oil	258	13.0
Light fuel oil	284	14.3
Heavy fuel oil	343	17.3
Lubricants	16	0.8
Asphalt	59	3.0
Other products	31	1.6
Total	1,980	100.0

SOURCE: Statistics Canada Catalogue No. 45-004, *Refined Petroleum Products*, Vol. 35, No. 1 (January 1980).

As a first step in this transition, the federal government has obtained commitments from four refineries to install by 1984 the facilities necessary to reduce substantially the production of heavy fuel oil.

At Sarnia, Ont., Petrosar Ltd. and Suncor Inc. have committed to reduce substantially their output of heavy fuel oil by the end of 1984. The cost of the necessary modifications may exceed $500 million. Imperial Oil Ltd. has also agreed to eliminate heavy fuel oil exports from its Strathcona, Alta., refinery by the end of 1982. Alternative methods of achieving this are being examined in connection with announced expansion plans for that refinery.

In return for these commitments, the Government has agreed not to change the basis under which heavy fuel oil exports are now taxed. All of these refineries have contracts for the sale of heavy fuel oil to United States consumers, and the Government of Canada has agreed to export charge rates for this product that provide attractive returns to the refineries. The Government no longer wishes to encourage the sale of heavy fuel oil on the export market; on the contrary, it wishes to see the product upgraded for domestic use. However, by allowing exports to continue for a short time, and leaving the refineries with substantial revenues from them, the Government will provide a further financial spur to upgrading investments. The companies are aware that this major concession is provided only for this reason; if the modifications in question fail to proceed at a rate commensurate with the companies' undertakings, the concession will be discontinued, and other measures will be introduced to ensure that upgrading occurs, and that the refinery output mix is consistent with Program goals.

Ultramar Canada Ltd. has agreed to a refinery conversion program at St-Romuald, Que., estimated to cost $150 million, in return for efforts by the federal government to improve the company's access to domestic crude oil.

As a result of these modifications at the four refineries involved, production of heavy fuel oil should fall by some 75,000 barrels a day by 1984—adding that amount to Canada's supply of oil feedstocks, and removing unnecessary competition to non-oil fuels.

This, however, does not solve the whole problem. In the Montreal area alone, refineries produce some 80,000 barrels a day of heavy fuel oil. While modifications to existing refineries could cut this production, it may be more efficient to install a central upgrading plant in the area, to process the heavy fuel oil from all refineries.

Petro-Canada is studying the possibility of constructing such a plant, which would process up to 80,000 barrels a day of heavy fuel oil. The Crown corporation will be reporting shortly on the results of this study.

Converting these 155,000 barrels a day of heavy fuel oil to lighter products represents one of the most efficient ways for Canada to obtain its oil product requirements. However, if the 10 per cent oil-share target is to be achieved—and it will be—additional volumes will need to be upgraded. The

Government of Canada expects that the industry will move quickly to ensure that this takes place.

The initiatives in the National Energy Program will expand the distribution network of other fuels, and foster use of new renewable sources. If, having made new and attractive non-oil options available, the Government is disappointed with the pace of conversions and of refinery modifications; if heavy fuel oil is blocking sales of non-oil fuels, then other measures will be put in place to ensure that upgrading proceeds at the pace needed to meet the 10 per cent target as soon as possible in the decade.

Saskatchewan Heavy Crude Oil Upgrading

The heavy crude oils of Saskatchewan and Alberta represent one of Canada's most promising avenues for sustained energy security and economic development in the region. Canadian companies have an unusually large presence in these fields. The reserves are large: nearly twice the reserves of light oil. Yet development has proceeded slowly. The reasons have been partly technical—getting that oil out of the ground is difficult, and only a small proportion of the oil can be recovered unless exotic, risky and expensive techniques are employed.

The National Energy Program provides new price and tax incentives for production of heavy crude oil by enhanced recovery processes. However, this will be of little purpose unless the oil can be sold in the domestic market. Historically, much of Canada's heavy crude oil output has had to seek export markets because it was difficult to transport it to distant refineries, and because most Canadian refineries, designed for light crude oil, are not equipped to handle heavy crudes. Even with the refinery modifications described above, there would still be little chance of using all western heavy crude oil in Canada. While the Government of Canada wishes refiners in eastern Canada to maximize their use of western heavy oil until upgrading facilities are constructed in the west, it is difficult to ship and sell the oil, as is, in the domestic market.

A basic premise of the National Energy Program is that resources should be upgraded in their province or region of production. The pricing and investment incentive regime in the Program will—if producers respond as

Heavy Crude Oil Upgrading

Crude oil is a complex mixture of components consisting mainly of hydrogen and carbon. An upgrading process involves taking a crude oil with a relatively high carbon content (heavy crude oil), and producing a product with a higher proportion of hydrogen (synthetic light crude oil). In addition to adding hydrogen, the process involves breaking down the heavy components of crude oil into smaller molecular structures.

There are two major categories of upgrading processes—coking and hydrocracking. The coking process removes carbon (in the form of petroleum coke), while the hydro-cracking process adds hydrogen. The Department of Energy, Mines and Resources has developed a hydrocracking process—the CANMET process. This process, which is under licence to Petro-Canada, is a serious contender for the Saskatchewan heavy oil upgrading project.

expected—ensure a supply of heavy crude oil that is adequate to support large-scale upgrading facilities.

It is urgent, therefore, that facilities be installed in producing areas to upgrade this heavy oil into a lighter synthetic crude, similar to the product of oil sands plants. This premium-quality product could be readily shipped to any domestic refinery.

Therefore, the National Energy Program includes a commitment by the Government of Canada to participate financially in a heavy crude oil upgrading plant in Saskatchewan. The estimated capital cost of this plant is in excess of $1 billion. The change in the federal income tax treatment of such plants will improve their viability. Negotiations are proceeding with a view to early establishment of a joint Canada-Saskatchewan venture involving Petro-Canada and Saskoil, but with an invitation to participation by private sector heavy oil producers.

A Greater Role for Renewable Energy

Canada is well endowed with non-renewable resources that can provide a bridge into a future where Canadians use less energy in their daily lives, and renewable energy plays a much larger role. Renewable energy in the form of hydro-electricity already contributes 24 per cent of Canada's energy. Other renewables contribute a share approximately equal to that of nuclear power. The true size of the renewable energy contribution is difficult to measure because a great deal of renewable energy does not enter the conventional market, and thus is excluded from most energy statistics. The realities of the energy future indicate the wisdom of accelerated efforts to develop new and renewable energy forms, to stand beside hydro-electricity as the basis for a sustained, clean, and economically viable energy structure. While most conventional forecasts imply a relatively modest role for renewables, it is clear that many Canadians do not share that view. Indeed, the dramatic surge in the use of wood for home heating and as a fuel in the forest industry suggests that these forecasts understate substantially the contribution to be made. Moreover, while forecasts are useful tools for analysis, they can tell us only what will happen under certain conditions. The conditions—the policies—are the keys. Many thoughtful and concerned Canadians believe that we should alter the forecast, that we should decide soon on a preferred energy future, and establish the conditions that will take us there.

The National Energy Program envisages a much greater role for renewable energy. The Government of Canada believes that economic realities now favour a range of renewable energy options. The National Energy Program will provide further incentives to the commercial use of these resources, both within the comprehensive off-oil effort already described, and in the form of special new or enriched programs. It will also provide increased funds, as described below, for research, development and demonstration of renewable energy.

As an immediate step, a program of demonstration projects for solar hot water heating, involving 1,000 homes across Canada, will be initiated. This program will illustrate to the public the technical feasibility of such systems and contribute to the commercialization of solar technology.

Remote communities, mostly in the north, have special energy problems—very high costs of fossil fuels and vulnerability to supply interruptions—that make these communities strong candidates for alternative energy and enhanced conservation. In order to show in a practical way what can be achieved, the Government will organize and finance a demonstration of renewable energy systems and enhanced conservation measures in a sample northern remote community. The objective will be to reduce the reliance of that

Renewable Energy Programs of the Federal Government

In July 1978, the Government of Canada announced a $380 million package of renewable energy programs for the period from 1979 to 1985. The most important of these measures are:

- A federal-provincial program to demonstrate a wide range of new technologies for both renewable energy and energy conservation. New conservation technologies to be demonstrated under the program include energy-efficient building designs, waste-heat recovery from industrial processes, and van-pool experiments. Renewable demonstrations agreed to for 1979-80 include harvesting fuel peat for use at a pulp and paper mill in Newfoundland, studying the commercial prospects of geothermal power applications in British Columbia, and a wind-diesel hybrid project demonstration in Ontario. Total program expenditures are expected to be approximately $300 million. The federal contribution will amount to about $113 million with the remaining share of the costs being split among the private sector and the provinces.

- Programs to encourage the use of biomass:
  - The *Forest Renewable Energy Program (FIRE)* provides financial incentives to the forest industry to use wood wastes in place of fossil fuel.
  - The *Biomass Loan Guarantee Program* encourages industry and communities to co-generate electricity and heat from biomass.
  - *Energy from the Forest (ENFOR)* program finances innovative research and development on biomass energy issues.
  - The *Development and Demonstration of Resource and Energy Conservation Technology (DRECT)* program funds the development of new technologies to produce energy from industrial and municipal wastes.
  - The *Agricultural Engineering Research and Development Program (AERD)* supports research development and demonstration of ways to reduce dependence on fossil fuels in the agricultural sector.

- Solar energy programs:
  - The *Purchase and Use of Solar Heating (PUSH)* procurement program under which the federal government purchases Canadian solar hot water and space heating systems for use on federal buildings and facilities;
  - The *Program of Assistance to Solar Equipment Manufacturers (PASEM)* through which 10 leading Canadian solar companies have received grants to design and develop solar heating equipment;
  - *Low Energy Building and Design Awards (LEBDA)*, a program which provides cash awards to encourage energy efficiency designs for both residential and commercial buildings; and
  - *Research and Development in Solar Energy*, an aggressive program of contracting out solar energy research and development.

- In wind energy, in addition to demonstrations under the federal-provincial program, the National Research Council carries on an extensive research and development program.

community on imported fossil fuels as much as possible, by renewable options such as wood gasification, photovoltaics, wind, small hydro, and by state-of-the-art conservation measures in the community's buildings and industries.

The federal government currently administers the FIRE (Forest Industries Renewable Energy) Program, which provides a substantial grant for forest industries that convert to wood waste. To encourage even greater displacement of petroleum by biomass fuels, this program will be expanded to apply to other organic materials such as agricultural and municipal wastes, and to cover all industrial and commercial establishments, in all areas. Grants will also be made available to firms that undertake cogeneration of electricity (the generation of electricity and process heat at the plant site). To provide additional flexibility, and make this program attractive even to the largest industries, the existing $4 million upper limit on grants will be removed.

To further enhance renewable supply, the Government proposes to establish immediately a new Canadian alternative energy corporation, to be called *Enertech Canada*, the mandate of which will be restricted to renewable energy and conservation technology. Initial funding of $20 million for this corporation is already in place. This Crown corporation will focus on supporting commercial production of renewable energy and conservation technology. It will reinforce the work of Canadian businesses engaged in this field by joint ventures and equity investments, and by offering other assistance in commercialization and marketing. It may also enter into shared ventures with energy corporations established by provincial governments, or it may undertake commercial production independently. Where necessary in order to further these activities the corporation will carry out research, development and demonstrations.

The corporation will be established initially as a subsidiary of Petro-Canada, which should permit it to benefit from Petro-Canada's leadership and established competence in costing, project analysis and management, and legal and financial services. After the corporation becomes an established and viable entity, it will be made an independent Crown corporation.

These initiatives mark the first major steps in the expansion of the role that renewable energy will play in Canada's economy. But they are, after all, only a beginning. Like the rest of the world, Canadians are only now starting to appreciate the possible contribution to be made by renewables. The technology is new, and changing rapidly. Now-costly techniques and equipment will become cheaper; in time, surely, much cheaper than oil. First-generation technology, with its inevitable risks and disappointments, will give way to more reliable hardware, adapted to Canadian conditions. The Government of Canada is watching this process with care, but it will do more than watch. It stands ready to pursue and support promising avenues in this new area, which could bring immense energy and economic benefits to Canadians.

The Government awaits with interest the findings of the House of Commons Special Committee on Alternative Energy and Oil Substitution,

which has been established to explore and report upon the utilization of alternative energy sources and technologies, identifying those with particular promise for reducing Canada's dependence on oil. The Committee will serve as a useful channel through which the views of individual Canadians can be introduced into the Government's future considerations.

The Government of Canada has set aside a substantial amount of funds "reserved for new energy initiatives." Renewable energy initiatives will get a fair call on that reserve. In a very real sense, the Government of Canada is inviting imaginative but realistic proposals for the pursuit and support of renewable energy options not addressed thus far in the National Energy Program.

Existing Energy Conservation Programs in Canada

The main elements of the energy conservation program in Canada are summarized by sector as follows:

Commercial-Residential. The *Canadian Home Insulation Program (CHIP)* provides a taxable grant to improve the insulation of homes built before 1961.

The *Home Insulation Program (HIP)* in P.E.I. and Nova Scotia offers a tax-free grant for insulation materials and partial coverage of labour costs for reinsulation. Approximately 70% of the existing housing stock in the two provinces have received grants.

Under the *Oil Furnace Retrofit Pilot Project* Energy, Mines and Resources Canada has identified areas to upgrade oil burner performance, and produced a manual on these techniques for oil burner servicers. The federal government has also assisted in implementing an oil furnace retrofit program in Prince Edward Island.

Energy Efficient New Housing Demonstrations. The Government has encouraged the design and construction of energy efficient new homes in Nova Scotia and Saskatchewan to demonstrate to builders and to homeowners that energy efficient new housing is practical and economic.

Ener$ave, a computerized home energy audit available free of charge, recommends cost effective actions for reducing energy consumption.

In co-operation with provincial governments, building energy codes and standards are being developed. "Measures for Energy Conservation in New Buildings", a recent federal government publication, is one of the results of this activity.

An Energy Conservation Task Force network is being formed to provide a forum for information transfer, training, research coordination, and other activities designed to stimulate energy conservation in buildings.

Industry. An industrial conservation program is operated on a voluntary basis through 15 *Industrial Energy Conservation Task Forces.*

Industry has essentially achieved a 1980 goal to improve energy efficiency by 12% since the commencement of the program. The task forces' new goal is to increase this efficiency gain to 23% by 1985.

Transportation. The most significant activity in the transportation sector is to establish standards for the average fuel consumption of new automobiles. The standards are 11.8 litres/100 km (24 mpg) for 1980 and 8.6 litres/100 km (33 mpg) for 1985. This program is supplemented by fuel consumption labelling for new automobiles, publications such as the *Fuel Consumption Guide* and *The Car Mileage Book*, and a tax on automobile air conditioners. Several provinces are also involved in a federal-provincial demonstration to promote van pooling.

The Federal Government's Internal Energy Conservation Program. The federal government reduced its own energy use in 1978-79 by 11.3% relative to energy use in the 1975-76 fiscal year. The cumulative cost savings since the program was introduced in 1976 exceed $100 million.

A More Vigorous Conservation Effort

Conservation provides the cleanest, most enduring, and, in many instances, the cheapest part of the solution to the oil problem of the 1980s, and to an improvement of the basic energy balance.

There is scope in every area, in every household, to reduce our demand for energy. While a special concern about oil means a shift toward other fuels, the answer does not lie in wasteful use of other energy sources, however plentiful they may now seem to be. Most of our current energy sources are non-renewable. This generation has a responsibility to husband these, as well as to develop other, more enduring solutions.

Moreover, curbing demand for all energy, from whatever source, frees up more energy resources, for a longer period, to replace oil. This buys a precious commodity: time. As indicated earlier, there is substantial over-capacity in our non-oil energy industry at present, even if exports are maintained at significant levels. Thus a substitution effort, with conservation, need not mean much of an increase in productive capacity in electricity or natural gas. In effect, conservation postpones the day when Canadians will have to make hard decisions about the pace at which we should develop for our own use supply options such as nuclear power and coal. It gives us the time to forge a consensus on the nation's energy path for the 1990s and beyond.

Many conservation investments are now attractive; the National Energy Program will provide further stimulus to private actions, and give leadership by example.

Residential Sector

The residential sector accounts for approximately 15 per cent of primary oil use, and 15 per cent of total primary energy use in Canada. Five separate initiatives are proposed to increase energy efficiency in this sector.

The Home Insulation Program (HIP) has been in place in Nova Scotia and Prince Edward Island since 1976. It was the forerunner of the Canadian Home Insulation Program (CHIP), which is currently the principal federal program to provide funds for improving the energy efficiency of homes in Canada. Under this program, homeowners can qualify for grants of up to $500 to assist them to insulate their homes. The CHIP budget, now set at $80 million a year, will be increased to $265 million annually, to ensure that it becomes fully effective and reaches its objective of upgrading 70 per cent of Canadian homes by 1987. The close co-operation of the provinces will be sought to ensure improved efficiency and fairness in the delivery of the program to the public.

Improving the energy efficiency of *existing* housing makes good sense. It must proceed faster than it has. However, we must also ensure that houses *now being built* are energy-efficient. Building energy efficiency into houses from the start is unquestionably preferable to modification of houses already built. Some members of the residential construction industry are clearly conscious of

the long-run benefits of energy-efficient housing, but there may be some reluctance on the part of other builders to provide such housing, because the capital cost would be somewhat higher than for traditional housing, even though—over time— the investment would pay off handsomely in energy cost savings.

Under present constitutional arrangements, the federal government's role in housing is limited. It does not have the power to regulate housing standards; this is a provincial responsibility. The federal role is, for the most part, limited to the provision of financial assistance. One of these federal measures is the provision or insurance of residential mortgages under the *National Housing Act.*

The Government of Canada has decided that this measure should be used in support of national energy objectives. Therefore, any new residential unit for which federal financial support or backing (e.g., under the *National Housing Act*) is sought after July 1, 1981, must meet federal energy efficiency standards. Where possible, these standards will be as agreed with provincial governments.

Improving Oil-Furnace Efficiency

The operating efficiency of the average residential oil furnace in Canada is about 65%. In effect, 35% of the oil burned goes up the chimney. The National Energy Program will provide financial assistance to upgrade oil-furnace efficiency in Newfoundland, Prince Edward Island and the northern Territories—areas where electricity is expensive and natural gas will not be available. This program, and the opportunities for improved efficiency, are based upon research carried out by the Canadian Combustion Research Laboratory (CCRL) in the Department of Energy, Mines and Resources since the early 1970s.

The CCRL researchers found that most domestic oil furnaces are oversized in relation to the actual heating requirements of the houses in which they are installed. Thus a change of the burner nozzle to one or two sizes smaller can save fuel by providing only the amount of heat that the furnace can efficiently distribute throughout the house.

Another fuel-saving device is the flame retention head. Fitted over the end of the oil burner, the retention head enables the burner to operate at higher carbon dioxide levels, resulting in greater efficiency. Installation of a retention head normally is accompanied by a change to a smaller nozzle.

A third energy-saving item is the delayed-action solenoid valve, which minimizes soot formation on heat-exchanger surfaces within the furnace—it helps keep the furnace clean. It also greatly reduces the amount of soot emitted into the atmosphere. Some existing furnaces will have the solenoid valve as part of the original equipment, so not all householders who are retrofitting will require this device.

The retrofit equipment—nozzles, retention heads and solenoid valves—is widely available, and the techniques for achieving greater furnace efficiency are being disseminated rapidly throughout the furnace-servicing industry. During 1979, EMR combustion specialists conducted training seminars across the country for oil-company supervisors and technical-school instructors, and this knowledge is being passed on.

An average fuel saving of about 20% could be obtained using this equipment. Cost of retrofitting runs between $100 and $200; for a home with an annual fuel bill of $600, the burner modification would pay for itself in less than two years. The National Energy Program will accelerate this payback in the above-mentioned regions.

Canada has become a world leader in the design and construction of super-efficient, low-energy buildings. But very few of these buildings are being constructed. To catalyze greatly increased construction of super-efficient residential buildings in Canada, the Government is providing $6 million for a program to support workshops and training programs, and the design and construction of 1,000 super-efficient, low-energy residences in Canada over the next two years.

The Government of Canada recognizes that some provinces are already actively involved in efforts to improve the efficiency of residential housing, but urges provincial governments to proceed with the development of energy-efficient building codes, and to take further steps within their jurisdiction to foster increased residential energy savings.

The Government of Canada has a unique opportunity to improve residential energy conservation in northern Canada, where it funds construction of much of the housing through various departments, the Yukon and Northwest Territories governments, and special agreements. As part of the National Energy Program the Government will develop new, energy-efficient, construction standards that are applicable to the Arctic region, and thereafter will require all new residential buildings to meet these standards.

As an alternative to federal assistance for conversion expenditures that are available on a national basis, an *enhanced conservation program* will be offered in provinces and territories where neither natural gas nor reasonably-priced electricity is available as an alternative to oil. In Newfoundland, Prince Edward Island, the Yukon and the Northwest Territories, the program will provide grants, additional to the CHIP or HIP incentives, for conservation expenditures. Eligible measures will include energy audits, oil furnace retrofits, and additional insulation. *The program will provide up to an $800 grant covering 50 per cent of eligible costs.*

The federal government will also set an example by accelerating its program to retrofit federal buildings, including about 25,000 residential units that it owns at defence bases, weather stations, transport facilities, and national parks. Structural alterations will be made to government-owned buildings when such changes can be shown to be cost-efficient. The Government of Canada will, of course, ensure high energy efficiency in any new buildings it constructs.

Industrial Sector

The industrial sector accounts for some 21 per cent of total primary energy use in Canada, and will have a decisive role in achieving energy security*. Much has been done already. Higher energy prices, and an awareness of national energy concerns, have led many Canadian companies to make substantial energy savings. However, there is still considerable room to reduce energy use in all industries. The National Energy Program will build upon an array of existing federal initiatives to further encourage this effort.

*This percentage excludes non-energy uses such as petrochemical feedstocks. If these were added, the share would rise by about 3%.

Under new federal initiatives, increased funding will be made available to double the number of government-industry seminars and workshops and to develop and deliver an employee motivation program for industry. An expanded energy audit program will be instituted, preferably under federal-provincial agreements, to assist industries and businesses to identify energy waste and plan corrective measures. It will strengthen the present industrial energy conservation program, including the Energy Bus Program.

The process of reducing demand for energy in existing industrial facilities must have a high priority. However, we must also consider future industrial structure. There is a danger that, with domestic prices below world levels, Canada will develop an industrial structure too heavily dependent on oil. This must not happen. Favourable oil prices can help Canada's competitive position, but this does not mean that we should use oil unwisely, or in place of other fuels or industrial feedstocks.

The petrochemical industry, for example, should not plan on using more oil in 1990 than it does now. Canada needs that oil for other purposes. For most petrochemical processes, feedstocks other than oil will do. Gas will be cheaper than oil in Canada. If, through good fortune, we discover huge oil reserves, we could consider increasing the use of oil for this purpose, but until then the wise course seems to be to depend on natural gas, LPGs or coal as a feedstock for further plants.

Transportation Sector

Transportation uses more oil than any other sector. Demand for transportation fuel continues to rise in Canada, in contrast to the situation in virtually every other industrial country. While there is some scope for substituting other fuels for gasoline—and the Program will foster this—substitution alone will by no means solve the problem, at least in the short run. The largest part of the solution is conservation.

However, settlement patterns in Canada, and individual lifestyles and attitudes, were developed in the days of cheap oil. It is neither realistic nor fair to expect these patterns to change overnight. Certainly they must change, but in a measured way that does not put at a disadvantage those who, through no fault of their own, now find themselves out of step with the realities of oil prices in the 1980s. This is an important reason why the Government of Canada rejects the simplistic "solution" of dramatic price increases for gasoline. Under the National Energy Program, the price of oil will nearly double in five years; this is signal enough of the need to cut our gasoline consumption.

There are already signs of change. Witness, for example, the installation of relatively inexpensive wind deflectors on tractor-trailer vehicles, which can cut truckers' fuel costs by as much as 15 per cent.

However, conservation in the transportation sector requires more than behavioural changes and adjustments on the part of vehicle owners. It requires a major change in vehicles, so they become more efficient. Canadian motorists do not drive their cars more miles per year than most Europeans; but there are more cars per capita in Canada, and the cars we drive use much more fuel per

mile. By world standards, Canadian automobiles waste fuel. The National Energy Program includes new legislation that would enable establishment of mandatory mileage standards designed for Canadian needs and conditions, to give the motor vehicle industry the basis for design and production in the 1980s.

In the United States, legislation passed in 1975 established mandatory standards for automobile fuel efficiency. These required manufacturers and importers to ensure that the sales-weighted average fuel consumption of the cars sold each year meets that year's standard. The progressively more severe standards require, in effect, a major redesign of North American automobiles.

In Canada, standards have been voluntary. However, it has become increasingly clear that the automobiles constructed to suit United States legislative standards do not necessarily reflect the realities of vehicle operation in the colder Canadian climate, nor do they take cognizance of the relation between Canadian fuel types, feedstocks and motor vehicle fuel requirements. As part of a general conservation and liquid fuels policy, Canada will develop its own standards.

Provincial governments have an important role to play in moderating the demand for transportation fuels. An array of policy measures—ranging from highway speed limits to municipal planning—is available to these governments. The Government of Canada recognizes the conservation achievements of the provinces. All governments recognize that there is scope for further action. Success of the National Energy Program will rest heavily upon the efforts of provincial governments. Nowhere is this more true than in the transportation sector.

Municipal Energy Management Program

Municipal affairs are a provincial responsibility in Canada. The federal role has been mainly to support provincial governments in the fulfillment of their responsibilities, usually through federal-provincial agreements.

Any program geared to energy security must address the energy challenge facing Canada's municipalities, where there is considerable room to contribute to an improvement of the national energy outlook. Some $20 million has been earmarked for a co-operative program that would combine the two goals of job creation and energy conservation, in Canada's municipalities. The program would involve the establishment of a Municipal Energy Management Program, to aid conservation efforts by municipal governments. The Government of Canada will seek the views of the provincial governments on this proposal.

Small Projects Fund

Energy conservation in all sectors can be promoted by a variety of low-cost projects. A conservation fund has been established at $1 million a year to finance such projects. Possible uses include detailed studies of conservation potential in particular industries, assistance to driver education, promotion of ride sharing, and new pilot programs in the residential sector.

Research and Development

Canada is a world leader in a range of energy technologies. Perhaps the greatest Canadian research triumph is the CANDU nuclear reactor system. This made-in-Canada energy system is among the world's best. We have a home-grown option, to use as Canadians wish in this decade and beyond.

This technical success resulted from a large investment of funds and personnel on the part of the Government of Canada—fully two-thirds of federal energy R&D expenditures ($160 million in 1979-80) is now devoted to the nuclear option, including research on nuclear fusion.

Current Energy Research and Development by the Federal Government

Current annual expenditures by the federal government on energy research and development total about $160 million. These expenditures are divided among five general *tasks*, as listed below:

Energy Conservation. The principal effort is on the reliability, practicality and economics of the application of energy conversion processes. There are 10 ongoing programs concerning: buildings, transportation, food supply systems, thermal wastes, municipal and industrial wastes, oil and gas combustion, industrial processes, energy conversion, storage and hydrogen systems, urban planning and operations, and consumer products and lifestyles.

Fossil Fuels. A major emphasis is on non-conventional oil and other energy sources. Even conventional sources, such as coal in western Canada, have a future that may be dependent upon emerging technology such as liquefaction, fluidized-bed combustion or in situ combustion.

Nuclear Energy. The federal government has historically provided strong support for the development of the CANDU heavy water reactor and associated systems. There are four programs: research and development in support of the regulatory functions of the Atomic Energy Control Board; assessment of uranium and thorium resources; support for nuclear energy utilization through Atomic Energy of Canada Limited; and the funding of selected areas of high quality fusion research.

Renewable Energy Resources. The emphasis of this task is directed towards establishing cost effective processes, techniques and equipment to permit a doubling of the contribution of renewable energy to meeting Canada's energy needs by the year 2000. There are five programs: hydraulic energy, solar, biomass, wind and geothermal.

Energy Transportation and Transmission. The special requirements of energy transportation in Arctic areas are the subject of research under this task. Other areas of study relate to transportation of hazardous commodities, high voltage direct current electrical transmission and fundamental cryogenic research.

*Estimated Energy R&D Expenditures of the Federal and Provincial Governments and Industry**

	Federal 1978-79	*Provincial 1978-79*	*Industry 1978*
		($ millions)	
Conservation	12	5	21
Fossil fuels	11	45	91
Nuclear energy	106	5	16
Renewable resources	15	9	6
Energy transportation and transmission	6	34	31
Other	1	1	–
Total	151	99	165

*Office of Energy Research and Development, Department of Energy, Mines and Resources.

This commitment will continue. Indeed, the effort will increase, in some areas, such as the development of methods for the safe disposal of radioactive waste. The overall R&D emphasis, however, must shift towards new energy priorities.

The three priorities for this increased effort are:

- *Alternatives to gasoline.* Canada has many fuel options. The challenge is to find the most promising, and provide the necessary support for commercialization, so that oil dependence can be quickly reduced in the transportation sector. R&D will give Canadians answers as to which options are technically feasible, environmentally acceptable, and economically viable.
- *Increased efficiency of energy use*, in all sectors of the economy.
- *New energy sources* ranging from coal—where technology must provide the key to environmentally safe use—to hydrogen, a promising option for future generations.

The transition from our current heavy reliance on fossil fuels is inevitable. It will be difficult and costly. Research and development provides a technological basis for long-term energy options beyond 1990. Canada, with its existing endowment of fossil fuels, has a unique opportunity to invest now in R&D activities that will provide a sound technological basis for the choice of transitions. Some provinces—notably Alberta—recognize the merits of R&D investment, and are playing a growing role. More support is needed at both levels of government. The Government of Canada has offered to fund jointly with Saskatchewan a 5-year, $50 million heavy oil R&D program. It will be essential to select a portfolio of R&D investments that recognizes regional diversity, and the need to develop a flexible energy supply system that can respond to a variety of contingencies.

Increased federal funding on the scale envisaged will require reorganization of federal science activities. There will be an extension of contracting-out procedures with industry for long-term developmental and transfer programs, diversification of Government laboratories, expansion of the in-house and contract research of Crown corporations, and extension of federal-provincial agreements to ensure concentration and co-ordination of efforts.

Research and development cannot, however, be left solely to governments. The private sector is often more capable of developing new alternatives. It has a responsibility to help find the answers to such thorny questions as how to extract, in an economic yet environmentally acceptable way, the oil stored in our enormous oil sands deposits. Yet expenditures in Canada on research and development by the energy industry are low by international standards. This is particularly true for the oil and gas sector, where most of the research takes place in the home country of multi-national companies. This practice must change. The Petroleum Monitoring Agency will be reviewing the activities of Canada's oil and gas companies, and the Government will increase its efforts to

ensure that significant increases of R&D expenditure take place. Firms in other parts of the energy sector should also respond more vigourously to Canada's R&D needs.

Regional Initiatives

The National Energy Program is a program for all Canadians. The made-in-Canada blended oil price system will ensure that all Canadians pay fair prices. The new federal energy taxes will provide the Government of Canada with the revenue necessary to play its full role in facilitating economic adjustment in all parts of Canada, and to undertake energy programs and policies that are national in scope and benefits. The Government's initiatives to foster increased Canadian ownership and control of the oil and gas industry will open opportunities for businesses across Canada to become involved in the prosperity of this sector. The energy-related investment surge, accelerated by the National Energy Program, will provide unprecedented opportunity for economic growth and new jobs in every region.

However, there is a regional dimension to be addressed. The sheer size of the country and the differences in population and resource endowments give Canadians in each region a distinct outlook and a particular set of needs and opportunities.

For Western Canada, rich in both conventional and non-conventional energy resources, the task is to build upon its energy and agricultural strengths a prosperous, diverse and enduring industrial base. The West has contributed enormously to Canada's prosperity, not least through the provision of secure, reasonably priced energy. In return, everything that can be done must be done to ensure that the West's aspirations are realized.

In the East, Atlantic Canada faces an energy future full of promise. Now, however, it relies heavily on oil — for fuel and for electricity generation — giving it special concerns and high energy costs. These special problems must be resolved, and the region's energy future secured.

Central Canada faces the challenge of achieving a rapid transformation of its present economy away from oil, through substitution and conservation actions. At the same time, it must sustain an industrial complex striving to remain competitive in domestic and international markets. The elements of the National Energy Program already described in this document bring enormous help to this region, in the form of reasonable and predictable energy prices, in direct Government funds to the region's residents and industries, and the promise of participation in the industrial benefits of the energy industry growth now certain to take place across the country.

In the North, our national objectives are to ease the energy cost burden resulting from the lack of near-term alternatives to oil and, for the longer term, to achieve resource development at a rate and in a manner compatible with a delicate social and environmental balance, recognizing that northerners will play a growing role in both the decisions and benefits associated with that development. As indicated earlier, decisive energy action now can buy

time for all of us — in the case of the North, time to ensure that native northerners in particular are adequately prepared for participation in development opportunities, and protected against the negative impacts that too often have characterized frontier resource development in Canada. In practical terms, this means the acceptance by the Government of Canada of a responsibility to establish more explicit and demanding ground rules for future energy projects. The Government will consult closely with northerners in the process of developing these new rules of the game.

The Government is particularly concerned to address immediately the special concerns of two regions: Western Canada, and the Atlantic region.

Western Canada

The Government is aware of a widespread feeling among people in Western Canada that the region has not shared equitably in the economic benefits of Confederation. This reflects an historic and diverse set of concerns about the influence of transportation facilities and costs, national trade policies and programs, and many other factors bearing on the pace of economic activity in the West, and on the willingness of secondary and service industries to locate there. Many of these factors are amenable to policies and actions by the Government of Canada. A wide array of measures is in place already, designed to address the particular endowments and challenges of the West. More will be done.

The deep-rooted nature of the West's concerns has influenced the atmosphere in which federal-provincial discussions on resource issues have taken place. The search for solutions in those discussions must take place in the context of the national interest, which the Government of Canada interprets not as one that serves the interests of some regions over others, but rather as one that serves the longer-term interest of all regions.

The National Energy Program is beneficial to the West. It provides an oil pricing schedule that yields substantial and growing revenues to provincial governments and the industry from existing production, and establishes certain and attractive prices for the risky and costly sources that will form the basis for a sustained prosperity. The oil sands and heavy oils will make a major and enduring contribution to the economy of the West, while enhancing national energy security.

The new incentive system for oil and gas exploration and development will foster accelerated efforts, and enhanced prosperity, among Canadian companies and individuals in the West. By ending the biases against Canadian involvement, the Program opens new doors to the large number of Canadian entrepreneurs already active in the industry, and gives them access to new large-scale sources of capital.

In developing its pricing and revenue-sharing system, the Government of Canada has demonstrated its willingness to be flexible; to compromise, in the interest of harmony, on important points. It has yielded significantly on key principles, including in particular its concern to share to a much greater extent

than in the past in the windfall gains from external oil price developments. Indeed, the federal government has gone much farther in its search for consensus. By agreeing to share in the proceeds of the current export tax on oil, the Government of Canada has given up a half share in a tax which it already had in place. This was in part because of a recognition of the inherent unfairness of taxing only oil exports. In short, the design of the Program took fully into account the need to foster a harmonious, co-operative relationship between the governments of the producing provinces and the Government of Canada.

The Program is particularly helpful to British Columbia. By foregoing a tax on natural gas exports, it leaves the provincial government with the fiscal capacity to move towards its energy security objectives, which are harmonious with those of the Government of Canada. With initiatives in the Program such as financial support for the Vancouver Island gas pipeline, the province can move rapidly to reduce its oil dependence, using its own energy sources.

For Saskatchewan, the Program brings special benefits. The price regime for enhanced recovery of heavy oil is the clear signal that the oil industry needs to embark on new efforts to produce oil from the multi-billion barrel reserve in the province. This means growth and employment for Saskatchewan. The heavy oil upgrader, to be proceeded with jointly, will provide an additional spur, by offering nearby and certain markets. The new R & D program will help provide the long-term answers to questions relating to the development of Saskatchewan's oil.

For Manitobans, the Program brings the certainty of moderate oil and natural gas prices. New incentives for conversion away from oil will accelerate the process in that province toward natural gas, electricity and renewable fuels. The Canadian Home Insulation Program will help Manitobans cut their use of energy. As will be shown later in this document, a Winnipeg household now dependent on fuel oil could, by conversion and conservation efforts, bring its 1984 heating bills below 1980 levels.

Manitoba will also share in the industrial benefits of the expansion that will take place in the Western Canadian oil and gas industry. Already, Manitoban industries have become important suppliers to the pipeline industry and other components of the sector. Under the more rigorous Canadian content provisions incorporated in the National Energy Program, the benefits to Manitoba's strategically-located industries should grow more rapidly than in the past.

Albertans, too, will benefit. The Program creates the basis for prosperity that will endure into the foreseeable future. Both the provincial government and the citizens of the province will be substantially better off than those of any other province. As will be outlined more fully in the next chapter of this document, the Government of Alberta will enjoy a substantial increase in the level of its resource revenues. These revenues will continue to increase over the decades to come.

The residents of the province will benefit significantly from the development surge built upon energy developments. The National Energy Program creates exciting new investment opportunities within the energy industry by providing both a stimulus to investment and new demand for natural gas. Federal government policies will also support expansion of activity based on Alberta's enormous coal deposits. In the short run the market opportunity lies mainly in exports; for the longer term, there will be continuing support for ways to foster domestic use of this fuel in both raw and liquefied form. Alberta has the resource base to support unprecedented prosperity for the foreseeable future. The National Energy Program will help transform this potential into reality.

There are challenges other than energy to be addressed. Some of them will require new policies at the federal level. Others will require a great deal of money to be spent on facilities that lie within federal jurisdiction. The Government is anxious to complement its national strategy with more specific measures to address issues of long-standing Western concern.

As a first step, the Government of Canada will establish a special fund of $4 billion to finance over the first part of the decade a series of economic development initiatives, to be chosen jointly by the two levels of government, in the four Western provinces.

The Government of Canada does not prejudge the disposition of these funds. Westerners will have much to say in this decision, as they should, and they will find the federal government eager to listen. It is anticipated, however, that much of this funding will be used for infrastructure improvements in the west, especially in transportation, for industrial development and diversification, and for agricultural and water programs. In particular, the Government of Canada envisages major and early investments in the upgrading of the Western Canadian railway system, and the improvement of ports, to enhance the access of Western Canadian products to world markets.

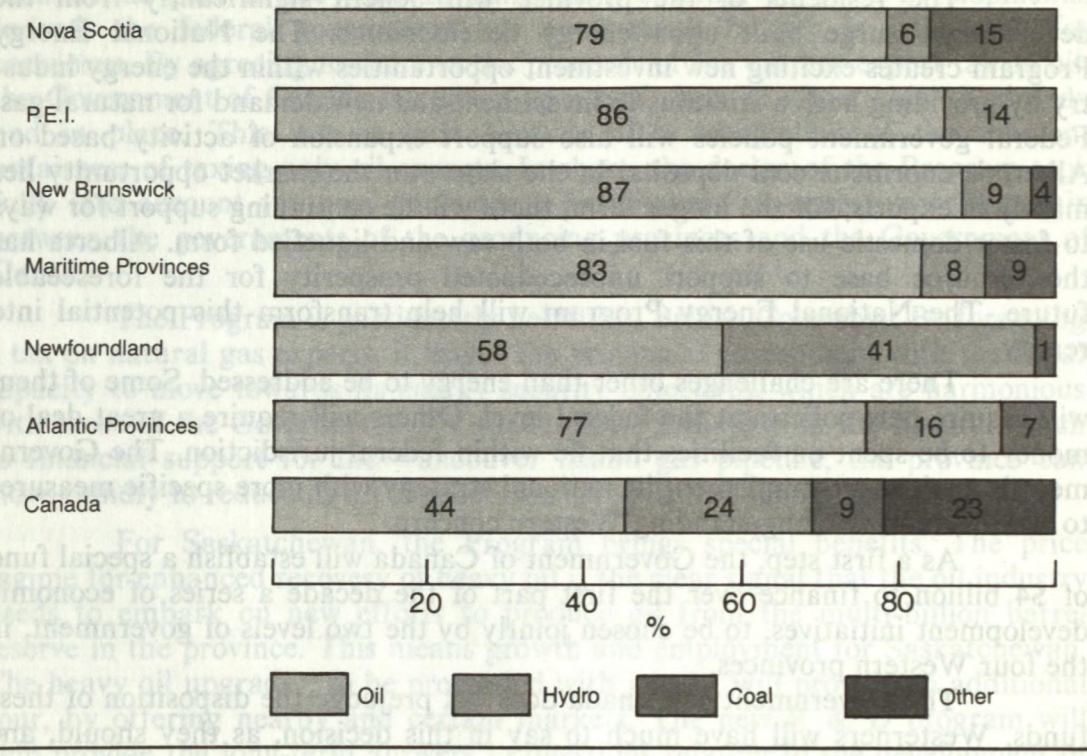
But the Government of Canada will bring more than money to the table. It will examine as a matter of high priority how its trade policies could be strengthened or modified to take into account the need to realize the potential of the West. It will also examine how best to facilitate the location of new linkage industries in the West and to encourage the type of diversified growth that Westerners believe should take place in the West.

This document has already noted the federal government's desire not to see more *oil*-based petrochemical capacity in Canada. This means concentration of future growth of this industry in Western Canada, principally in Alberta. The Government of Canada will support this trend. This, moreover, can be simply the beginning of the new Western diversity, with the appropriate policies and actions. The Government of Canada promises these, and soon.

Atlantic Canada

The initiatives already described will bring large energy and economic benefits to the Atlantic region. The program assisting household conversions away from oil, for example, will involve new federal expenditures in the region

Atlantic Primary Energy Consumption, 1979



Oil-Fired Electricity Generation by Province (1979)

	Total Generation of Electricity	*Estimated Electricity Generated from Oil*	*Share Generated from Oil*
	(GWh)		(%)
Newfoundland*	8,226	1,304	15.9
Prince Edward Island	151	151	100.0
Nova Scotia	6,166	3,927	63.7
New Brunswick	9,166	5,702	62.2
Atlantic provinces	23,709	11,084	46.8
Quebec	88,988	457	0.5
Ontario	109,081	2,015	1.8
Manitoba	20,614	23	0.1
Saskatchewan	9,106	13	0.1
Alberta	21,603	20	0.1
British Columbia	43,173	2,065	4.8
Yukon and N.W.T.	741	134	18.1
Rest of Canada	328,596	4,727	1.4
Total Canada	352,305	15,811	4.5

*For purpose of this table, transfers from Churchill Falls to Quebec of 35,290 GWh are excluded from Newfoundland's, but included in "Rest of Canada," total since this power is now entirely exported from the province.

of about $425 million over the next decade. The Petroleum Incentives Program will spur exploration in the promising offshore region, and the new legislation for the Canada Lands will ensure an appropriate pace of development and maximize the onshore benefits of this activity. Virtually every element of the National Energy Program will have an impact on the residents of Atlantic Canada.

However, Atlantic Canada's problems and opportunities are special. Therefore, there will be a special additional program for Atlantic Canada. This program, which will involve some $440 million over the period 1980-83, and additional expenditures thereafter, provides a graphic demonstration of the principles underlying the National Energy Program: energy security, opportunity to participate, and fairness.

An improvement in the oil situation in Atlantic Canada is essential; it can wait no longer. Solving Atlantic Canada's oil problem would help solve Canada's problem of exposure to imported oil and would enhance regional and national security.

As for opportunity, the Atlantic region, long disadvantaged in a number of ways, stands on the verge of an energy boom—oil and gas, electricity, and coal—that could provide the basis for a new, sustainable prosperity. The National Energy Program can—and does—provide the framework to ensure that this happens.

As for fairness, residents of Atlantic Canada pay more for electricity than most other Canadians, and are less able to bear these higher costs. The National Energy Program must—and does—address this inequity.

The goals of the Atlantic energy program are to :

- Launch a once-and-for-all shift off oil;
- Improve overall efficiency of energy use within the region;
- Hold down the growth of energy costs; and
- Assist provinces to benefit, according to their own circumstances, from the development of regional energy options.

The opportunities are considerable; it is not implausible that by 1990 the Atlantic region will be not only supplying its own energy needs but also supplying oil, gas and electricity to other areas. Over the next few years, however, provinces that are currently short of revenue appear to need outside assistance to develop major energy supply options, and initiate those conservation and substitution measures that are now viable.

In the past, the absence of transportation systems has denied Atlantic Canada access to assured supplies of Canadian oil and gas. The federal government has decided that the natural gas pipeline system should be extended beyond Montreal to Quebec City and the Maritimes. This pipeline should be engineered in a way that facilitates economical reversal of flows, bearing in mind that Atlantic gas resources may be sufficient to support sales outside the region.

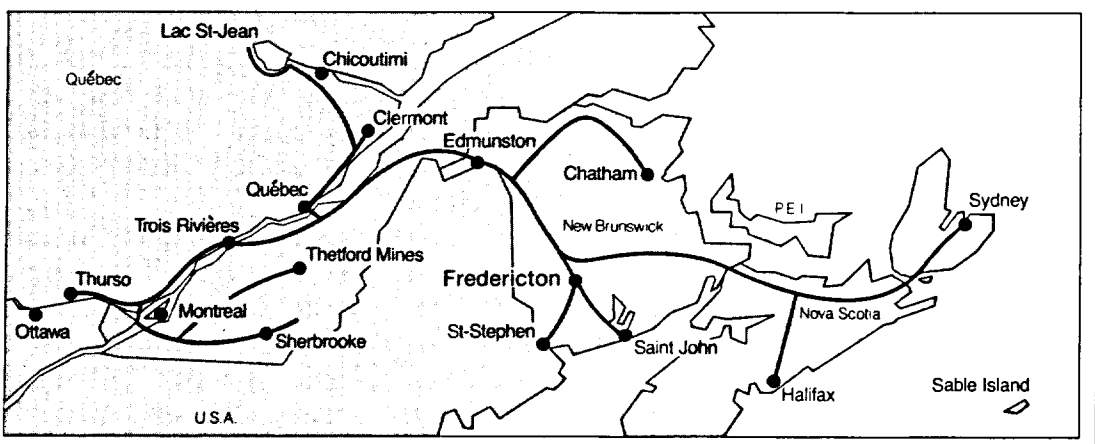
Several issues remain to be resolved before the National Energy Board can give approval to the Maritimes portion of this line. The Government of Canada wishes to see these issues resolved quickly. The gas prices in the National Energy Program should provide a basis for commercial viability of the line and associated distribution systems. The pricing system would establish prices at the city gate in Halifax at the same level as those in southern Ontario and Quebec. The Government of Canada will, however, involve itself in the mainline, if necessary, to ensure that it proceeds quickly. Prompt action will permit construction of the pipeline with minimum delay, with a target of having gas available to Maritime consumers by 1983.

The rapid development of offshore gas and oil has the potential to displace higher-cost supplies in the second half of the decade and bring major economic benefits to the region. Initiatives such as the new Canada Lands legislation will establish close control over exploration and development off the east coast. The new legislation will also provide strong requirements for the procurement of equipment and services in Canada. Through Petro-Canada, and through its other departments and agencies, the federal government is prepared to discuss with Canadian firms ways to ensure local procurement for as large a share as possible of the equipment and services required by anticipated multi-billion-dollar offshore activities.

The high cost of energy in the Atlantic region is largely due to the region's heavy reliance on oil for electrical generation. An *immediate priority* is to replace existing oil-fired capacity with lower-cost alternatives. In the short term, the lowest-cost alternatives appear to be conversions of some existing oil-fired plants to coal, increased use of hydro power from Quebec, and regional use of power from the Point Lepreau nuclear station in New Brunswick. The key to these efforts is increased regional co-operation, which the Government of Canada will encourage through generous financial assistance.

A Utility Off-Oil Fund will be established, with funding over the initial four years of $175 million to finance on a grant basis up to 75 per cent of

Trans Quebec & Maritimes Pipeline Proposal: Gas to the Maritimes



the cost of environmentally acceptable conversions of oil-fired electricity plants to coal. This offers the opportunity for immediate conversions at plants such as Coleson Cove in New Brunswick and Tufts Cove in Nova Scotia.

Federal financing of interprovincial electrical inter-connections will continue to be made available. As in the past, up to 50 per cent of such investments will be eligible for federal loans at Crown corporation rates. Quebec and Labrador offer the potential of providing an economic and growing contribution to energy supply in the Maritime provinces without the need for any other special assistance from the Government of Canada.

The *second priority* in electricity development is to support those investments that are essential longer-term steps in the efficient expansion of non-oil electricity generating systems. To this end, two special initiatives will be undertaken.

First, provision has been made for an equity contribution of up to $200 million in support of hydro development on the lower Churchill in Labrador. In addition to equity contributions, federal credit support will also be provided to ensure that debt financing for the development can be obtained at acceptable rates. There has as yet been no final decision by either the Newfoundland government or the Government of Canada on which of the two major development possibilities—Gull Island and Muskrat Falls—will be undertaken. The Lower Churchill Development Corporation has recently released recommendations to its shareholders dealing with these two projects. The Corporation's recommendations are now under active consideration.

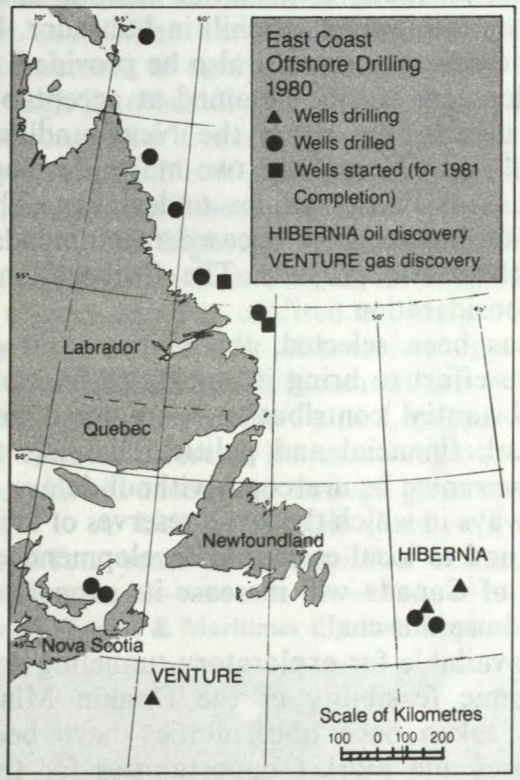
Once one of these projects has been selected, the Government of Canada will participate vigorously in the effort to bring it quickly to fruition. Projects such as these can make a substantial contribution to regional and national energy objectives. The technical, financial and political barriers to rapid development of lower Churchill power must be overcome without delay.

Second, there is a need to find ways in which the large reserves of local coal can contribute to off-oil objectives, and to local economic development, on a viable, lasting basis. The Government of Canada will increase its support of studies to determine how best to mine and use this coal.

Sufficient funds will be made available for exploratory tunneling and assessment of the technical and economic feasibility of the Donkin Mine. Decisions on subsequent steps will be taken once uncertainties have been resolved concerning quality characteristics and market opportunities for this coal. The Government of Canada will see to it that development of this mine, and other viable local coal sources, is not delayed on account of lack of funding. Moreover, it will play its full part in overcoming the technical challenges confronting these developments.

In support of expanded coal mining and utilization activities, there will be a need for an additional $4 million during the next four years for coal research and development. Priorities include health and mine safety, coal beneficiation, combustion and utilization research, establishment of a Coal Testing Institute, and establishment of a continuing program in mining technology.

Cape Breton coal can make an important contribution to the energy supply of Nova Scotia and the Maritimes. The challenge is to develop technologies to utilize that coal in more efficient and environmentally benign ways. To further that development, the federal government will provide $50 million over the period 1980-83, with provision for a further $100 million in 1984-85, to support the development and commercialization of new coal-utilization technology. It is envisaged that the bulk of this funding will go to demonstrating fluidized-bed combustion in a commercial-scale generating station in Cape Breton, where it would directly displace oil-fired capacity. Alternative means to use coal in the production of liquid fuels will also be actively pursued.



Power from the Lower Churchill

The Churchill River in Labrador is unique in North America in that its great hydro-electric potential can be captured at three points.

The existing power station at Churchill Falls, about 300 km from the river's mouth, can generate 5225 MW(e)—about two-thirds of the river's total potential, and the energy equivalent of 165 thousand barrels of oil a day.

The two other sites are Gull Island, 200 km downstream from Churchill Falls, and Muskrat Falls, where the river empties into Lake Melville. The combined potential generating capacity at these sites is equivalent to a further 74 thousand barrels of oil a day. Such development could reduce substantially Atlantic Canada's dependence on oil.

In November 1978 the Governments of Canada and Newfoundland signed an agreement forming the Lower Churchill Development Corporation Limited (LCDC), with Newfoundland holding 51% of the corporation's shares, and Canada 49%.

LCDC's initial tasks were to determine the costs and construction schedules for developing generating capacity at Gull Island and Muskrat Falls, as well as transmission facilities; to examine markets for power; to assess the environmental impacts and to develop a financial plan. In late June 1980 the LCDC submitted its report and recommendations to the two governments.

The report stated that development of generating capacity at both sites is technically feasible, as is the construction of a transmission line from Labrador to the Island of Newfoundland via a submarine cable across the Strait of Belle Isle. It also said that these developments would have minimal environmental impact.

The LCDC recommended construction at the Muskrat Falls site at an estimated cost of $3.2 billion. The project would take 5½ years and would have a generating capacity of 618 MW(e). The Gull Island project was estimated to cost $4.3 billion. It would generate 1,698 MW(e) and would take 6½ years to complete.

Renewable energy represents an obvious and desirable option for improved supply in the Atlantic region. In addition to expanded national renewables programs, extension of the P.E.I. Conservation and Renewable Energy Agreement will be undertaken, at a four-year cost of over $9 million. The special emphasis on renewables development in P.E.I. reflects the support

How Fluidized-Bed Combustion Works

In fluidized-bed combustion, air is blasted into the bottom of a furnace chamber filled with inert, granular material, such as sand or limestone. The air, which is preheated, lifts the granular material into a churning, fluidized state. The fuel—coal, waste wood, or other combustible refuse—is fed into the bed from above or below. Heated by contact with the inert material and hot air, the fuel burns, releasing more heat.

Fluidized-bed combustion has several advantages:

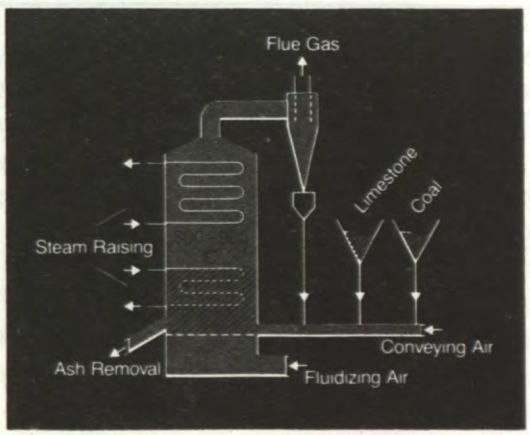
- Limestone added to the bed reacts with sulphur dioxide to form sulphates that remain in the bed, thus reducing atmospheric sulphur dioxide emissions by up to 90%.
- Combustion occurs at 800–900°C. instead of the 1400–1700°C. of conventional systems. These lower temperatures significantly reduce nitrogen oxide emissions.
- Because the ratio of inert material to fuel in the bed is high (100:1), low-grade fuels can be utilized—coal with high sulphur and ash content, wood wastes, and municipal wastes such as garbage and sewage sludge.
- Heat transfer efficiency is significantly higher.
- Improved uniformity of heat release promises a significant increase in overall efficiency.

"Atmospheric" fluidized-bed combustion boilers are commercially available in sizes up to about 5 MW(e) equivalent for industrial applications. A United States demonstration unit rated at 10 MW(e) equivalent is undergoing trials.

However, the technology for utility-sized coal-burning fluidized-bed combustion has yet to be proven. A utility demonstration at Rivesville, West Virginia, will be followed by demonstrations on the 20 and 200 MW(e) scale by the Tennessee Valley Authority. These will be operational in 1982 and 1986, respectively. A comparable demonstration plant is under construction in West Germany.

Canada's FBC demonstration program includes:

- A heating plant at Summerside, P.E.I., fueled by coal and up to 30% wood chips; detailed design under way; commissioning late 1982.
- A coal dryer at Coal Valley, Alberta, fueled by coal washery rejects; conceptual design being evaluated; commissioning expected in 1982.
- An industrial boiler (site to be selected) fueled by coal and wood waste; commissioning due in 1986.
- A utility boiler fueled by Cape Breton coal; pre-feasibility study recommended site at Port Hawkesbury, N.S., commissioning expected in 1987.
- A "pressurized" fluidized-bed combustion at the B.C. Hydro thermal power station at Hat Creek, fueled by high-ash coal; feasibility study completed; commissioning expected in 1990.



given to conservation and renewable energies by public action and public policy in that province. In Nova Scotia, demonstrations of low-head hydro projects will, it is hoped, yield clues to the feasibility of a range of options, from the small community-oriented facility to a world-scale site that would capture electric power from the Fundy tides. The Government of Canada is contributing $25 million to this project.

While the special Atlantic programs support a range of energy supply options that are designed to limit the growth of energy costs to the consumer, nothing is more essential to the early reduction and lasting containment of energy costs than conservation and energy-efficiency improvements. Added to national conservation initiatives will be two programs especially responsive to the concerns of the Atlantic provinces.

An *Industrial Conservation Program will provide $30 million to support up to 50 per cent of the cost of energy-efficiency improvements* in an industrial sector whose energy intensity is well above the national average. Improved insulation in buildings is an essential component of this program. Other eligible improvements include process changes, equipment retrofit, and waste heat recovery, utilization and co-generation. An additional $1 million will be devoted to the study of potentially economic district-heating schemes.

As neither Newfoundland nor Prince Edward Island will have access to western natural gas, a program that provides for a major housing retrofit—energy audits, oil-furnace retrofit, additional insulation—will be instituted. Financial assistance provided to households will be identical in amount and form to that provided under the off-oil conversion program: a grant covering 50 per cent of costs up to a maximum of $800. As noted earlier, this program will also be made available in the Yukon and Northwest Territories.

Assistance will be provided to consumers, as in other provinces, to switch from oil to other fuels. Assistance for conversions to electric heating will not be immediately available in the Atlantic region, however. Discussions with each provincial government will be held to determine at which point dependence

P.E.I. Renewable Energy Technology

Renewable energy research on Prince Edward Island is being administered under a federal-provincial agreement and managed through the Institute of Man and Resources by a federal-provincial management committee.

Wood as an energy source has been demonstrated under the energy agreement proving that wood chips can be produced from otherwise unsaleable forest stands and marketed as fuel at reasonable cost.

Wind power has been the subject of extensive study. The Institute has established the Atlantic Wind Test Site at North Cape for intensive testing and evaluation of wind and wind-related energy systems, researching both the vertical axis and propeller wind mills.

Solar energy is a major part of the work under the agreement and public demonstrations are being arranged showing the operation of solar assisted water heating. Other solar heating programs are underway including promoting development of solar equipment manufacturing on the island.

on oil for electricity generation is sufficiently low as to make conversions to electricity a sensible option. The rationalization of the region's electricity generation systems is already taking place and could be accelerated if the lowest-cost short-term supply options, located primarily in the Quebec and New Brunswick systems, are able to supply the three Maritime provinces. The federal government does not, however, favour the use of natural gas to generate electricity. Otherwise, the development of lower-cost alternatives may be unduly delayed.

Strengthening Our Oil Supply Resilience

The only real assurance against oil supply interuption is not to import oil at all. The National Energy Program will bring oil security in this decade. Until this is achieved, however, Canada like other consuming countries will continue to be exposed to the possibility of supply curtailments, and international oil price pressures.

Although Canada now depends on imports for only 25 per cent of its oil needs, provision must be made against the possibility of supply restrictions as a result of a major breakdown of the international or domestic oil system, through deliberate interruption of overseas supply, or because of turmoil in a major producing country.

Provision must also be made against the possibility, already experienced on several occasions, of a tightness in the supply system which, though falling short of a conventionally-defined emergency, could put pressure on the Canadian market, perhaps concentrated in certain regions or on certain refiners or distributors. This "grey area", which might or might not be related to a global supply disruption, can have a major impact on the world economy. As proof one need only consider the enormous world oil price increases that occurred in 1979 as panic buying, precipitated by the Iranian crisis, led to unnecessarily intense competition among oil buyers.

Canada's current imported oil supply comes entirely from the multinational companies. These firms have the extensive intra-company supply linkages, the organization, and technical and financial skills to allow them to meet Canada's needs. Canada's refining industry, and its retail gasoline and home heating sector, are dominated by these firms. The marketing arrangements set up by the major integrated companies have worked well. Canada's oil needs have been met efficiently and consistently. However, the future will impose new strains on Canada's oil importing system.

Under previous policies, Canada's oil imports were projected to grow substantially. The National Energy Program alters the forecast dramatically. Imports will be brought to zero by 1990. However, it may take time for the Program to moderate oil demand; in the meantime, Canada's conventional oil production is projected to decline significantly. It may be, therefore, that imports will rise somewhat in the next few years, before declining. Thus, in contrast to the situation in most other oil-importing countries, we may need more imported oil for a time, and then very little.

Moreover, Canada will require lighter crudes than will many countries. Most of our refineries are presently designed for light Canadian oil. It will take time for them to adjust to heavier crudes. Also, with abundant natural gas, which can be easily substituted for the heavier end of a refinery's output, we need lighter oils to produce the range of products needed for the Canadian market.

At the same time, the international oil market is gradually changing. The control of the major oil firms over supply is being reduced. Their ability to guarantee supplies to a market has been lessened.

Canada must continue to rely primarily on the multi-nationals for its imported oil. As long as these companies hold their current position both internationally and in Canada's domestic wholesale and retail market, this reliance is sensible. The Government of Canada will look to the major firms to intensify their efforts to ensure that Canada has continued adequate supplies of imported crude oil.

Nevertheless, there are actions which the Government can take. The new oil realities necessitate national and international government efforts to provide a supporting and strengthening framework for private sector action. For Canada, increased resilience to international oil market insecurity will be augmented in four ways:

(1) *Through collective arrangements to share major oil supply shortfalls with our major industrial partners through the International Energy Agency.* In the event of an emergency reduction of 7 per cent or more in the oil supply to one or all of the participating countries, the IEA's emergency sharing scheme is automatically triggered. Available supplies are allocated in such a way as to ensure that each country will receive oil which, when supplemented by the drawdown of previously set-aside emergency oil stocks, will be sufficient to sustain at least 90 per cent of normal consumption.

(2) *Through bilateral oil purchase arrangements with selected oil producers.* The first step in this process is the agreement with Mexico under which the Mexican state oil company, Pemex, will provide to Petro-Canada some 50,000 barrels a day of oil by the end of 1980, under a 10-year Governmental agreement. Exploratory discussions are proceeding with other countries both within and outside OPEC. These state-to-state arrangements may provide an opportunity for wider trade and industrial co-operation both within and outside the energy sector.

(3) *Through an emergency oil allocation system that will ensure demand restraint to the extent necessary and distribution of available oil within Canada on an efficient and fair basis.* In 1979, Parliament authorized the establishment of a new Energy Supplies Allocation Board. The responsibilities of this Board are to prepare contingency plans for the allocation of crude oil and petroleum products and for

gasoline rationing. These plans would be activated in the event of an actual or anticipated shortage of petroleum severe enough to affect Canada's economy or security.

(4) *Through increased oil storage.* At present, Canadian refiners hold stocks equivalent, on average, to 80–90 days supply. However, most of this is required to respond to normal market demand fluctuations; in certain market circumstances, only a portion of the inventory would be available for emergency purposes. Additional inventories would afford a useful degree of protection against overseas interruptions. However, the refining industry lacks the commercial incentive to hold inventories greater than those dictated by an operational need to meet contingencies such as abnormal weather or refinery malfunctions. In fact, rising crude oil prices have sharply increased the cost of holding inventories and have led most refiners to decrease their operational stocks in recent years.

Consultations with refiners have indicated that the industry reduced its oil stock levels considerably in 1978-79, despite general agreement that the world oil situation would appear to indicate a need for increased storage. It may be that individual industry members are hesitant to maintain greater stocks, because other, less far-sighted competitors will escape the cost of increased storage and thus gain a competitive advantage.

The Government of Canada is disturbed at this trend. It should be reversed. The federal government wishes to *increase* oil storage in Canada, to increase our resilience to interruptions. This would provide additional insurance for the nation, and ease concerns in areas still heavily dependent on oil. Early discussions will be held with the refining industry, to examine ways and means of implementing a voluntary program of stock-building.

Projected Costs of the National Energy Program

This is not the time for half-measures in energy. Nothing less than an all-out effort will do. The energy challenge is real and substantial; the opportunities are enormous. These opportunities will be realized if Canadians respond quickly and fully to the National Energy Program.

The Program comprises a set of pricing policies and new legislative instruments to address both the supply and demand sides of the energy equation. It also includes an array of reinforcing mechanisms, which will involve large financial commitments by the Government of Canada, to supplement programs now in place at the federal and provincial level.

These financial commitments are made at a time when the fiscal position of the Government of Canada is less healthy than is desirable. One course of action would have been to apply most if not all of the revenues accruing from new energy taxes to the effort to reduce the federal budgetary

Energy Expenditures, 1980-83 (in $ millions)

Existing Programs

EMR (Principal Energy Programs)
- Energy Sector
- Canada Centre for Mineral and Energy Technology
- Payments to Alberta for Energy R & D Projects
- Federal-Provincial Conservation and Renewable Energy Demonstration Agreements
- Forest Industry Renewable Energy Program
- Interprovincial PipeLine Statutory Deficiency Payments
- Annapolis Hydro Project
- Joint Canada-Saskatchewan Program for the Development of Heavy Oil Recovery Technology
- Payments to Lower Churchill Development Corporation
- Loans for Regional Electrical Interconnections
- Federal Share of the Canadian Electrical Association R & D Program

Atomic Energy of Canada Limited

Atomic Energy Control Board

Cape Breton Development Corporation

National Energy Board

Northern Pipeline Agency

Petro-Canada

Other Departments and Agencies
- Canadian Home Insulation Program
- Home Insulation Program (PEI and Nova Scotia)
- Purchase and Use of Solar Heating Program
- Program of Assistance to Solar Energy Manufacturers
- Energy from the Forest
- Solar Energy Research Program

3,410

New Initiatives

Industry Incentives • Exploration • Development • Non-Conventional Oil • Heavy Crude Oil Upgrading	2,550
Gas Bank	440
Oil Substitution • Conversion Grants • Conversion of Federal Buildings • Distribution System Incentives • Transmission System Support • Propane Vehicle Initiative • Propane Demonstration (Government fleets)	1,620
Conservation and Renewables • Expanded CHIP • Industrial Audits • Seminars and Workshops • Mileage Standards • Retrofit Federal Buildings • Arctic Community Demonstration • Arctic Housing Standards • Solar Demonstration (Residential Hot Water) • FIRE Extension • Municipal Energy Management Program • New Housing Guidelines • Remote Communities Initiative • Agricultural Sector Initiatives • Super-Efficient Housing Demonstration • Small Projects Fund • Super-Retrofit (Newfoundland, P.E.I., Yukon, N.W.T.)	1,150
Special Atlantic Canada Program • Utility Off-Oil Fund • Lower Churchill Development Corporation • Coal Utilization Package • Coal R&D • P.E.I. Conservation and Renewable Energy Agreement Extension • Industrial Conservation	460
Upgraders	310
Research and Development	260
Petro-Canada International	200
Future Initiatives	1,200
	8,190

Total Energy Expenditures $11,600 million.

deficit. The Government has chosen not to do so. Rather, it will apply the greatest proportion of the new funds to energy—to an investment in Canada's energy security. This investment will pay very large dividends, all across the country, in energy and economic terms. The Government of Canada believes most Canadians will endorse this view of national priorities at this time.

How large will this investment be? Over the period to 1983, the Government of Canada will make available over $8 billion for new energy action programs, as well as $2 billion for the Western Development Fund. This will be in addition to the federal government's existing and on-going energy effort, projected to cost some $3.4 billion over the period, and the costs of the Oil Import Compensation Program, which could amount to $3.3 billion. There are additional commitments beyond 1983, including a further $2 billion for the Western Development Fund, and $400–500 million for Atlantic Canada. This is an unprecedented level of expenditure for this sector, but one which faithfully reflects the national government's assessment of the stakes involved in putting right Canada's energy and economic future.

THE IMPACT

The National Energy Program was designed to respond to all of the challenges set out in the Problems section of this document. The first challenge is to improve the oil supply-demand balance; to achieve, as soon as possible, independence from the world oil market. The second challenge is to give Canadians a greater opportunity to participate in the energy industry, directly and through the spin-off benefits associated with a rapidly growing sector. The third challenge is to achieve an oil and gas revenue-sharing system that is compatible with the principle of fairness.

Energy Security

The prognosis, under previous policies, was a worsening of Canada's oil supply-demand balance, with growing reliance on oil imports. Demand was anticipated to continue rising, while supply capacity declined, over most of the decade.

Oil Supply

Production from established conventional oil reserves in western Canada will decline substantially over the decade. New discoveries of western conventional oil are expected, but are unlikely to be of sufficient size to offset this decline. New methods of oil extraction such as tertiary recovery will make a growing contribution, but insufficient to make up the shortfall. Major oil sands plants are already in place, providing some 150 thousand barrels a day of premium quality oil, and others are planned. The reserves are enormous. However, it seems most unlikely that large-scale plants could be brought on stream rapidly enough to close the gap between demand projected under previous policies, and domestic supply, until the 1990s at least.

As for the frontier, there is encouraging evidence of major deposits, but the contribution to be made in the short term is likely to be relatively modest. Certainly, it would be premature and unwise to count on the frontier to solve the oil supply problem.

The National Energy Program seeks to improve the oil supply outlook. It does so in three ways. First, it establishes attractive and certain prices for new supplies, so that the industry has the incentive to reinvest. Second, it establishes rich new direct incentives for investment. Third, it provides the necessary cash.

Wellhead prices for conventional oil will quadruple over the next 10 years, providing the promise of high investment returns on new production. From the producer's point of view, the most important issue is the netback—the return after payment of royalties, operating costs, and the new Petroleum and Gas Revenue Tax. Producer netbacks per barrel of conventional oil will rise, under the pricing schedule in the Program, to an estimated $24 in 1990. This *four-fold increase* over the 1979 level will provide ample incentive to the search for new supply.

Projected Oil Production

	1979	*1985*	*1990*
		(Mb/d)	
Conventional	1,388	914	713
Non-conventional	102	326	733
Pentanes plus	118	114	73
Subtotal*	1,608	**1,354**	**1,519**
Gas plant LPGs	161	159	133
Total	1,769	1,513	1,652
*For comparison, supply projection in EMR November, 1979 *Canadian Oil and Gas Supply/Demand Overview:*		**1,356**	**1,518**

The National Energy Program Will Spur Oil Sands Development

The positive impact of the Program on oil sands development can be illustrated by its effect on the commercial viability of the Alsands project, a venture headed by Shell Canada Resources Limited, with participation by eight other companies, including Petro-Canada. Because the project—and others like it—are important to our energy objectives, the Government of Canada is concerned to provide a rate of return on this $8 billion project that is high enough to attract private investment.

In 1978, when the sponsors presented an application to the Alberta Energy Resources Conservation Board, they projected that, under the then current pricing, tax and their proposed royalty regimes, they expected a rate of return of somewhat less than 17%. International prices were then $14.88 a barrel and were expected to grow at 7% a year leading to a start-up price of $27.36 a barrel in 1986. At that time, they indicated that their target, or minimum acceptable rate of return, was 18%.

Since then, costs have risen, but so too has the price the federal government is offering. Under the National Energy Program, such a project would get an estimated $63 a barrel for its first year of production in 1987, more than twice what was expected, and this price would rise by the rate of inflation. With the provincial royalty system understood to have been considered by the Province of Alberta, the expected rate of return for the project should exceed the firm's target. Clearly, the National Energy Program provides an attractive rate of return and should ensure the early construction of this project, and thereby enhance Canada's oil supply.

*Projected Approximate Prices for Future Oil Projects**

	Possible Start-Up Date	*Price for First Year of Production†*
		($/bbl)
Suncor Expansion	1982-83	42
Syncrude Expansion	1985-86	54
Cold Lake Project	1987	63
Alsands Project	1987	63
Petro-Canada and Nova Oil Sands Project	1990-91	80
Saskatchewan Heavy Tertiary	1982-83	33
Judy Creek Light Tertiary	1983	39
Hibernia	1986-87	39‡

* Actual prices depend upon the future rate of domestic inflation (Consumer Price Index).

† Subject to cap of world price.

‡ Assuming conventional prices.

For non-conventional supply—the oil sands and tertiary-recovery oil—the Program offers high, rising, and predictable prices. The reference price for oil sands is essentially equivalent to the current world price, and will be escalated by the inflation rate. This reference price, together with other new federal incentives, yields a projected rate of return equal to the target established earlier by the major project sponsors. If the Province of Alberta approves these projects, and establishes a reasonable royalty structure, there should be no reason for further delay in construction of these important projects.

For tertiary recovery oil, which is a special concern of the province of Saskatchewan, the Program offers substantially higher prices than those provided for conventional oil. The reference price of $30 a barrel, adjusted for inflation, should bring on a substantial proportion of western Canada's heavy oil deposits, and spur improved recovery of lighter crude oils.

Prices, however, are only one element of the incentive to invest. Historically, the Government of Canada has provided powerful investment incentives through the tax system. As has been described, this system has important shortcomings in terms of broad national objectives. The National Energy Program alters the nature of the incentive, reflecting a desire to favour Canadian companies and individuals, while maintaining a generous package of incentives.

Estimated Netbacks from Oil and Natural Gas (before corporate taxes)*

	1975	*1979*	*1981*	*1983*	*1985*	*1990*
			($)			
Gas Netbacks						
Wellhead price†	0.59	1.85	2.90	4.08	5.23	8.54
Operating cost	0.11	0.22	0.27	0.33	0.41	0.66
Royalties	0.11	0.69	1.07	1.51	1.94	3.16
PGRT‡	–	–	0.21	0.30	0.39	0.63
Netback before corp. taxes	0.37	0.94	1.35	1.94	2.49	4.09
Oil Netbacks						
Wellhead price	7.26	13.20	18.25	22.25	30.63	65.00
Operating costs	0.63	1.37	1.78	2.31	3.00	5.78
Royalties	2.25	5.54	7.86	9.73	13.69	29.90
PGRT‡	–	–	1.32	1.59	2.21	4.74
Netback before corp. taxes	4.38	6.29	7.29	8.62	11.73	24.58

*An oil or gas producer's netback is the amount of revenue retained per barrel or per Mcf by the producer after payment of operating costs and royalties. In some cases, netback is expressed in terms of revenues after deduction of corporate taxes as well. However, the result is a less reliable measure of the operator's position, because not all firms are currently taxable. Moreover, it is also difficult to allocate capital costs of specific barrels or Mcf's.

While the aggregate revenue share accruing to the industry as a whole provides an essential overall picture of its financial capacity, the netback figures are useful "shorthand" indicators of actual realizations, and hence of producer profitability.

†Includes the flowback from export sales.

‡Petroleum and Gas Revenue Tax.

A typical company producing gas in Alberta will receive $1.35 a thousand cubic feet for its production in 1981. Under the previous system, if the firm was not in a taxpaying position, and was unable to borrow money, it would be able to reinvest only the $1.35 in exploration. Under the new incentive system, the firm would be able to obtain through the Petroleum Incentives Program up to 80 per cent of its exploration costs. With $1.35 in cash, the firm could invest a total of $2.08 in exploration on provincial lands, or some $6.75 in the Canada Lands. The prospect of payments under the new incentive program will represent a major new form of collateral for fund-raising efforts by such a

After-Tax Cost of Exploration to the Typical Canadian Individual Investor: With Federal Incentive Payments*

		National Energy Program	
	Previous Policy	*Provincial Lands*	*Canada Lands*
		($)	
Expenditure	1.00	1.00	1.00
Incentive Payment	—	0.35	0.80
Tax savings	0.40	0.26	0.08
Net cost	0.60†	0.39	0.12

*Assumes no resource income and a marginal tax rate of 40%.

†With super-depletion which, until March 1980, applied to well costs in excess of $5 million, this after-tax cost would be reduced to $0.33. Wells in this cost-category exist almost exclusively on Canada Lands.

After-Tax Costs of an Exploration Investment for Corporations: With Federal Incentive Payments

		National Energy Program			
	Previous Policy	*Provincial Lands*†		*Canada Lands*	
	All Canada	*Canadian Company*‡	*Foreign Company*	*Canadian Company*‡	*Foreign Company*
		($)			
Expenditure	1.00	1.00	1.00	1.00	1.00
Incentive payment	—	0.35	—	0.80	0.25
Net expenditure (i.e. amount payable by firm without taxable income)	1.00	0.65	1.00	0.20	0.75
Tax savings (at 47%) (for taxable companies)	0.63	0.31	0.47	0.13	0.47
After-tax, after-incentive costs	0.37*	0.34	0.53	0.07	0.28

*The after-tax cost of exploration in the frontier when the super-depletion allowance existed would be reduced $0.60 for well costs in excess of $5 million per well.

†Effective 1984.

‡At least 75% Canadian owned and Canadian controlled.

firm. Moreover, the Program will have a similar leverage effect on drilling funds, thus making outside capital even more readily available to aggressive explorers.

The incentive payment rate is lower on provincial lands for two principal reasons. First, exploration in the frontier is considerably more risky, and the return probably more distant, than in the traditional producing areas. Second, the producing provinces have in place important incentives of their own, designed to foster in-province exploration and development.

The reinvestment incentive for foreign-controlled firms is, of course, less generous. However, the retention for a period of the earned depletion allowance for exploration will provide time for these companies to increase their level of Canadian ownership and control to a point where they qualify for increased incentives under the Petroleum Incentives Program. Moreover, while the total incentive is not as rich for these firms as the previous set of incentives, it remains—by world standards—attractive. On the Canada Lands, the after-tax, after-petroleum incentive payment costs of exploration by a foreign-controlled firm would be 28¢ per dollar in 1981 and thereafter. In provincial lands, the net cash cost to foreign firms would be 37¢ per dollar in 1981 and 53¢ per dollar in 1984.

The Program offers additional encouragement to invest in the heavy oils of Saskatchewan and Alberta. By giving earned depletion, Petroleum Incentive Payments, and status as a resource activity to heavy crude oil upgraders, and by involving itself directly in an upgrading facility in Saskatchewan, the Government of Canada will provide a major stimulus to heavy oil development. This will serve both regional and national interests.

A key issue in the debate about oil and natural gas pricing has been whether the industry will have sufficient funds to invest in the activities needed to bring on new supplies. As noted earlier, the Program will encourage the entry of new Canadian investors and provide new instruments such as the Natural Gas Bank to bring new capital to the industry. It is not necessary to provide the industry's total investment needs from internally-generated cash flow from sales of existing oil and gas. However, the Program will provide large and rising cash flow to the industry. From about $4.6 billion in 1979, it will rise to $8.2 billion in 1983. In addition, by 1983, contributions under the Petroleum Incentives Program will increase the industry's reinvestment capacity by over $1 billion a year.

Thus, the industry as a whole should not lack the cash—from production revenue and from new sources of capital—to do the job.

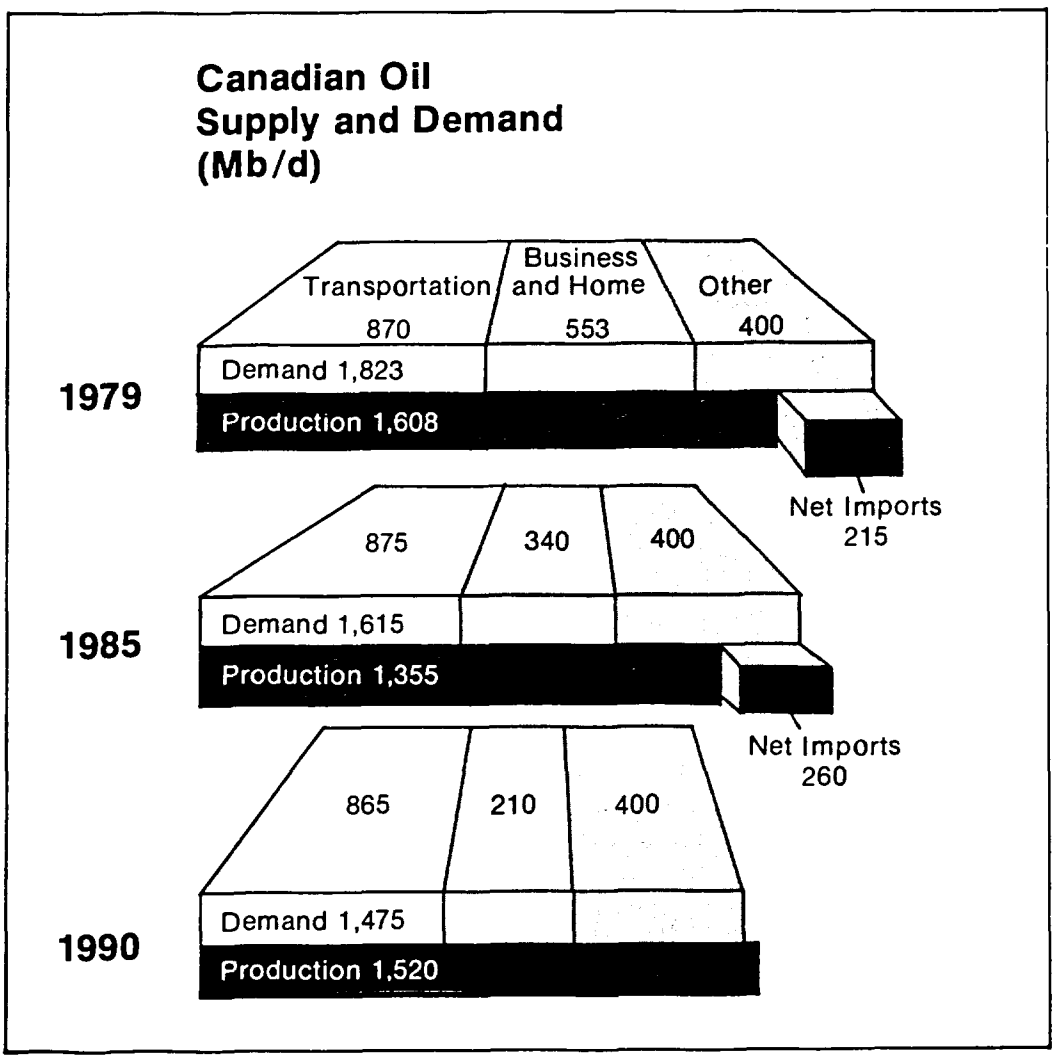
The National Energy Program includes other important stimuli to the oil search. In the Canada Lands, exploration will be accelerated through more stringent work requirements applied to those holding land now, as well as future licensees. Also, the capacity of Petro-Canada to act as a leader and catalyst in frontier exploration will be increased substantially.

In sum, the National Energy Program reconfirms the national government's commitment to oil supply development. The question is: how should the new price and incentive system be translated into a supply forecast? There is a

basis for optimism. The new system should result in more vigorous exploration, especially in the frontier. There are new and encouraging signs of early production potential, especially from the east coast off-shore.

However, all too often over the past decade, expectations with respect to new oil supply have been dashed; major projects have been delayed, initial exploratory results have sometimes raised false hopes. It is never possible to forecast the exact path of supply development. The latest oil supply forecast by the Government of Canada was contained in a report published in November 1979 by the Department of Energy, Mines and Resources. The forecast used as a basis for the National Energy Program assumes no increase in oil supply, over and above the supply then expected to be available.

In short, the National Energy Program does not assume a "supply solution" to the nation's oil import problem. The supply forecast may well turn out to be pessimistic, in which case Canada could be in the enviable position of having an oil surplus. However, this in no way reduces the obligation to improve



the domestic oil supply-demand balance now. The major part of the solution, as has been suggested earlier in this document, is to reduce oil demand to a level consistent with reasonably-anticipated domestic supply.

Oil Demand

While providing strong support to new oil supply, the National Energy Program makes a massive, unprecedented commitment to improving the demand side of the equation. The centre-piece of the National Energy Program is a drive to reduce oil consumption, through conservation efforts and the use of more plentiful fuels in place of oil. Some $3 billion in direct investments in support of substitution and conservation will be made over the period to 1983 by the Government of Canada, and new conservation legislation will be put in place. The national government will set an example, and use pricing policies and other direct instruments to foster the move away from oil.

Oil Consumption

	1979	*1985*	*1990*
		(Mb/d)	
Previous Policy	1,823	1,905	1,809
National Energy Program		1,615	1,475
Reduction		290	334

Oil Consumption by Sector under National Energy Program

	1979	*1985*	*1990*
		(Mb/d)	
Transportation	870	875	865
Residential/Commercial/Industrial	553	340	210
Other	400	400	400
Total	1,823	1,615	1,475

Projected Fuel Shares in Total Primary Energy Demands Under National Energy Program

	1979	*1990*
	(%)	
Oil	42.6	26.7
Gas	18.0	22.7
LPGs	0.6	1.7
Primary electricity	26.7	32.2
Coal	9.0	10.7
Renewables, additional to hydro-electricity*	3.1	6.0
Total—Percentage	100.0	100.0
—Btu's $\times 10^{15}$	9.2	11.3

* The renewable energy share includes primarily waste wood and spent pulping liquor. It does not include the amount of renewable energy that is collected and used for which no statistics are currently available such as the residential use of fuelwood and solar energy.

Oil Demand and Supply Outlook

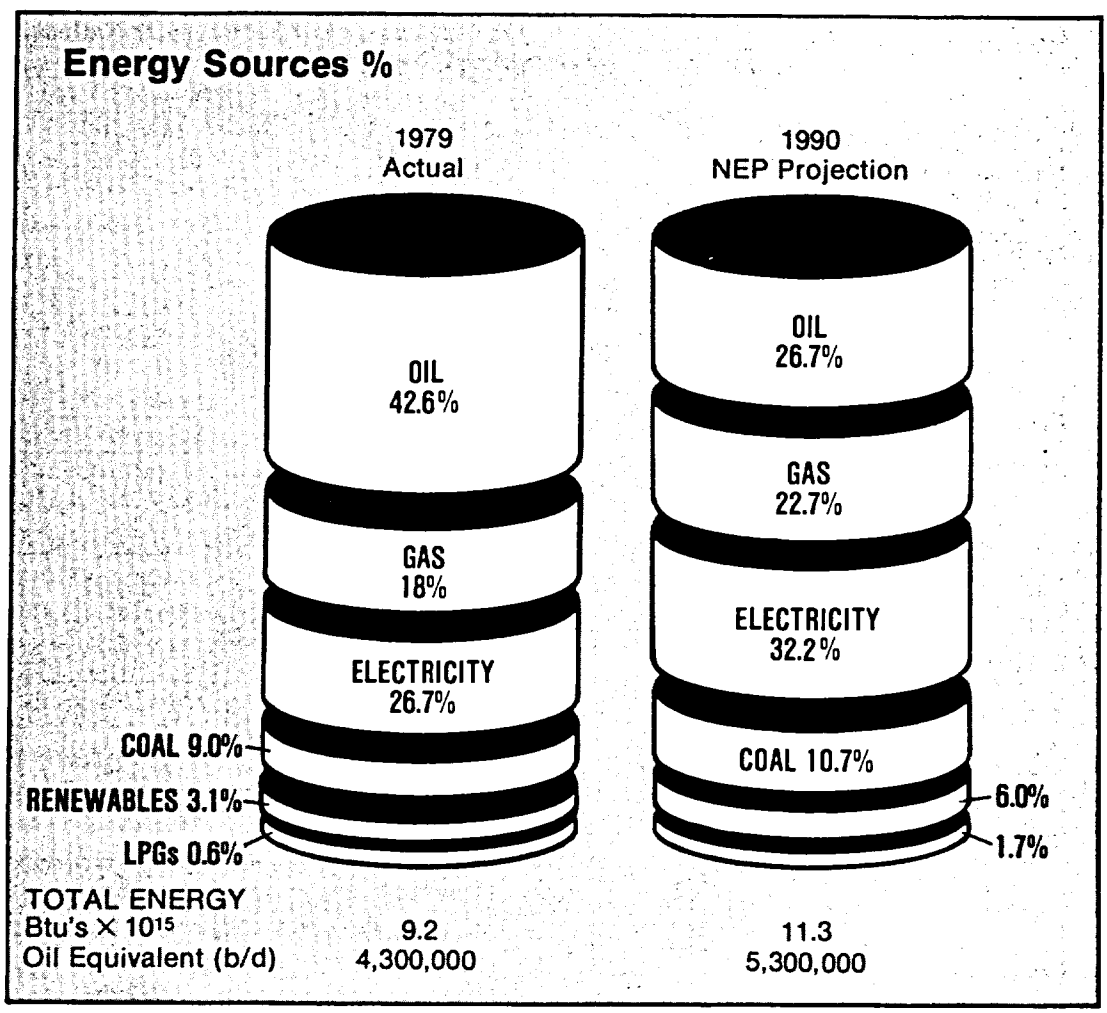
	1979	*1985*	*1990*
		(Mb/d)	
Production	1,608	1,355	1,520
Demand	1,823	1,615	1,475
Net Imports (net exports)	215	260	(45)
Net Imports under IEA Definition*	114	180	(55)

*Adjustments include stock changes and LPG exports.

As noted earlier, Canada has the resource base to support a quick and massive shift away from oil. The 10 per cent target was adopted on this basis, and the incentive programs geared to that objective.

If Canadian industry and individuals respond as expected to the conservation and off-oil incentives—including attractive prices for non-oil fuels—Canada will achieve independence from the world oil market by 1990 or, with maximum effort, earlier in this decade. All of the private and government investments needed to achieve this goal are economically viable in their own right. The individual conservation and conversion actions needed to achieve the objective are commercially attractive; indeed, most of them represent the best investment opportunities that householders and industries can make. The National Energy Program reinforces this incentive, and reduces cash-flow barriers. As noted earlier, there is no technical reason why the off-oil process could not proceed at least as quickly—given widespread and vigorous effort—as envisaged in the Program.

Under the Program, oil consumption will be *reduced* 20 per cent from 1,847,000 barrels a day in 1979 to 1,475,000 barrels a day in 1990. This will



take place against a backdrop of an assumed average annual increase of 3.2 per cent in economic growth, emphasizing the magnitude of the off-oil shift envisaged by the Program. The biggest drop in oil demand will occur in the residential, commercial and industrial sectors where, largely because of the substitution program, oil consumption will be cut in half. The National Energy Program will stabilize consumption in the use of oil for transportation.

Will the Effort to Substitute More Natural Gas for Oil Result in Shortfalls in our Gas Supply?

A key premise of the National Energy Program is that gas is plentiful in Canada relative to oil. Results of exploration since the dramatic price increases of the mid-1970s tend to support this view; over the past five years, additions to gas reserves in the conventional areas alone exceed cumulative production by some 7.5 Tcf. There is a broad consensus that this trend can be sustained for some time.

Based on recent NEB projections, supply from conventional producing areas in western Canada alone will be able to meet both our domestic requirements and export commitments beyond 1990. With the incentives provided by the National Energy Program, more natural gas will be added to reserves in western Canada than those estimated by the NEB in its November 1979 report. Also, substantial quantities of natural gas have already been discovered in frontier areas such as the Mackenzie Delta, the Arctic Islands and east coast off-shore.

Taking into account the most recent approvals, some 14.5 Tcf of gas is now authorized under licence for export to the United States. If—as now expected—there is a surplus of gas over the period of the licences, this gas will be exported. However, should domestic requirements exceed presently forecast levels, or domestic supplies fall short of expectations, the National Energy Board would review the level of exports that it was willing to allow.

Under the National Energy Program there will probably be a modest increase in the demand for natural gas compared to previous policy. However, even based on a conservative supply outlook, there will be sufficient natural gas available to Canadians, even with a major substitution effort, for the foreseeable future.

Natural Gas Consumption

	1979	*1985*	*1990*
		(Bcf)	
Previous Policy	1,637	2,018	2,492
National Energy Program		2,318	2,568
Increase		300	76

Natural Gas Supply and Demand

	N.E.P. Domestic Demand	*Licensed Exports Incl. Fuel*	*Total Demand*	*Conventional Supply Capability**	*Annual Surplus*	*Accumulated Surplus*
			(Bcf)			
1980	1,650	1,350	3,000	3,939	939	939
1981	1,770	1,593	3,363	4,091	728	1,667.
1982	1,915	1,842	3,757	4,217	460	2,127
1983	2,070	1,824	3,894	4,378	484	2,611
1984	2,195	1,825	4,020	4,373	353	2,964
1985	2,320	1,716	4,036	4,430	394	3,358
1986	2,377	1,519	3,896	4,240	344	3,702
1987	2,424	1,286	3,710	4,058	348	4,050
1988	2,480	913	3,393	3,871	478	4,528
1989	2,522	607	3,129	3,724	595	5,123
1990	2,568	245	2,813	3,577	764	5,887

*NEB November 1979 estimates (net of reprocessing shrinkage).

Petrochemicals represent another key area where oil savings must be made, relative to previous forecasts. If the energy goal is to be achieved, future petrochemical developments will almost certainly have to be based on natural gas, LPGs, or possibly coal.

Oil currently provides about 43 per cent of Canada's primary energy demands. Natural gas provides only 18 per cent of these demands, and electricity about 27 per cent. The National Energy Program reduces oil's share of the energy market to 27 per cent by 1990, raises the share provided by natural gas to 23 per cent, and increases electricity's contribution to 32 per cent. It will double, to about 6 per cent, the contribution of renewable energy sources other than hydro-electricity. If the trend in energy use initiated by the National Energy Program continues into the 1990s, oil's position could conceivably be reduced to third place in Canada within that decade.

A reduction of oil use, even to the dramatic extent envisaged now, need not result in any substantial increase in the demand for other energy. The substitution effort is not at the expense of conservation goals. Higher prices, coupled with direct conservation incentives under the National Energy Program, will moderate overall energy demand. The annual rate of growth in total primary energy demand is projected to be 1.9 per cent over the period to 1990.

This outlook is mirrored in the projections for individual fuels. The annual demand for natural gas is expected to be about 75 billion cubic feet (3 per cent) higher in 1990 than it would have been under previous policies, but on the basis of current forecasts this would create no problem for longer-term supply. The National Energy Program provides rich incentives to natural gas supply. Similarly, electrical demand is not expected to rise appreciably faster than it would have under previous policies. New transmission systems will bring natural gas into competition with electricity in areas hitherto having to choose between oil and electricity. Also, the growing contribution of renewable energy will cut into electrical markets, as well as oil usage.

Energy Opportunity

The Problems chapter noted that while there were enormous opportunities associated with the petroleum industry in the 1980s and beyond, Canadians would—under previous policies—have too little involvement in them. Moreover, the role of the industry in the national economy was becoming so large that it was imperative to have a larger Canadian presence, in the form of both ownership and control. Finally, measures were needed to ensure that the broader economic and industrial benefits of the industry's growth were fully captured by Canadians.

The Program has three goals for the petroleum industry:

- At least 50 per cent Canadian ownership of oil and gas production by 1990;
- Canadian control of a significant number of the larger oil and gas firms; and

- An early increase in the share of the oil and gas sector owned by the Government of Canada.

To achieve these goals, The National Energy Program alters in a fundamental way the framework that has given rise to the current dominance by foreign firms. The Program favours Canadian companies and individuals, although it leaves the foreign-owned firm with a reasonable share of production revenues. In parallel, through such instruments as the reference price system and the new regime for the Canada Lands, it will place upon the industry a more explicit obligation to become more Canadian, and to ensure that industrial benefits of energy development are widely shared in Canada. Through their national government's active acquisition program, Canadians will have an increased opportunity to involve themselves in a key sector of the economy; one whose current prosperity and growth prospects are unrivalled in the Canadian economy.

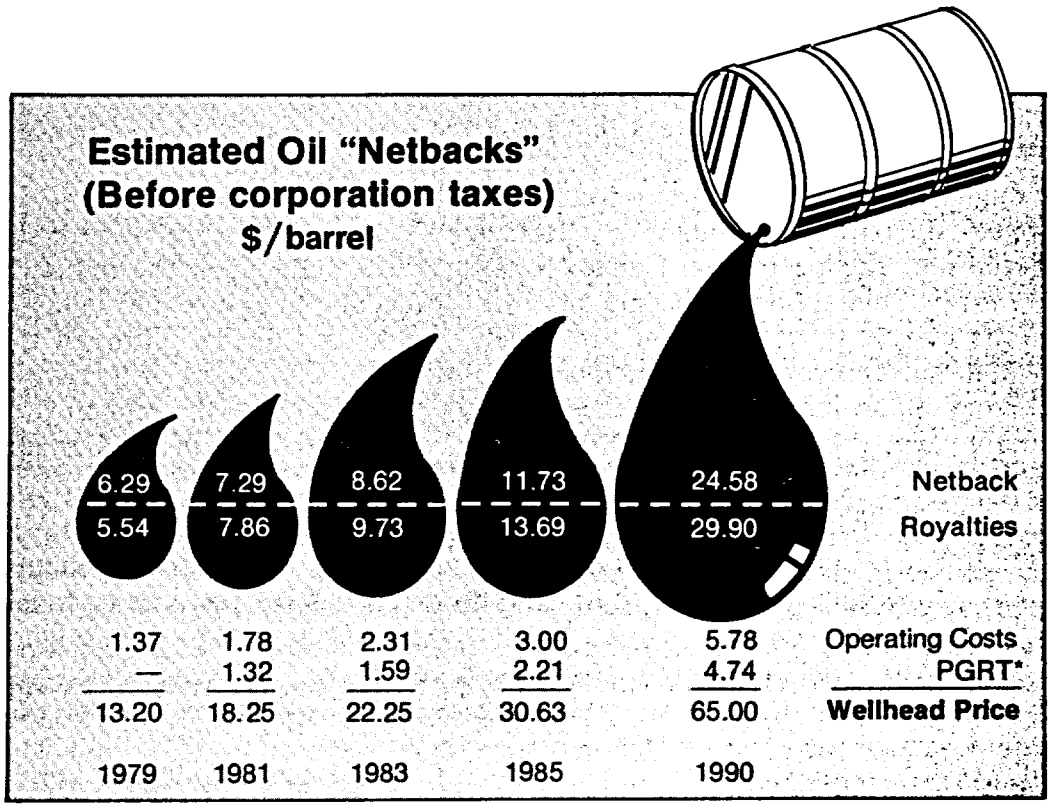
The new vehicles that will bring about this change include:

- Petroleum Incentive Payments that lower the cost of investment to Canadians, including those who do not now have resource or taxable income;
- A Natural Gas Bank to ease the cash-flow constraint faced by small Canadian firms;
- A 50 per cent Canadian participation requirement for Canada Lands;
- A major Government of Canada acquisition program; and
- Strict requirements for use of Canadian goods and services in exploration, development and production programs on the Canada Lands, and in major non-conventional oil projects.

The Petroleum Incentives Program will contribute significantly to the oil search, in a way that, unlike the previous system, favours Canadian investors. Earlier it was shown that the cost of investment for Canadians was very low. With ever-increasing prices, and a reference price system for expensive oils, the incentive to invest is powerful.

Will Canadians have the cash to invest? Will the small Canadian firms be able to gather the funds necessary to explore aggressively? As has been shown, a Canadian firm investing in frontier exploration can obtain through the Petroleum Incentives Program payments of roughly $4 for every $1 the firm is able to invest. This dramatic leverage effect was available, under previous policies, only to taxpaying firms, by and large foreign owned. Thus, the National Energy Program reverses an undesirable bias in the incentive system, creating the basis for a dramatically expanded Canadian presence.

The National Energy Program offers more. Drilling funds, already an attractive source of investment, will become a better bet for the typical Canadian investor, who will be able to take advantage of generous incentives under the Petroleum Incentives Program. In the past few years, drilling funds and other external sources have provided as much as $1 billion a year to the



*Petroleum and Gas Revenue Tax.

industry. The Program will encourage more Canadians to participate in these vehicles, and Canadian firms will be able to use this source even more than they have to date. Also, the Natural Gas Bank, with funding of over $400 million, will be available to help Canadian gas firms suffering from cash-flow constraints because of a shortage of markets.

In short, Canadian firms will lack neither the incentive nor the cash to be aggressive in the search for new petroleum supplies. There is no shortage of Canadian entrepreneurial talent. The National Energy Program provides the necessary encouragement, and access to the financial wherewithal.

The ownership requirements on the Canada Lands will lead in time to a much greater involvement by Canadian firms. The new incentives make investing in these regions very attractive. A typical well in Canada's off-shore now costs $30 million; a 25 per cent share would cost $7.5 million. For a Canadian-owned and Canadian-controlled firm, the after-tax cost of that 25 per cent share would be about $500,000, if the firm could use the tax incentives. The individual Canadian investor could participate through a drilling fund. Such a vehicle could acquire a 25 per cent share for about $500,000 if the fund were made up of individuals at the top marginal tax rate, and for less than $1 million for those at a 40 per cent marginal tax rate.

The ownership and control targets and the acquisition program will significantly alter the structure of the industry. At present the industry is

dominated by large foreign-owned firms, many with little or no Canadian equity participation, and none with as much as 50 per cent Canadian ownership. This will change. Some of the larger firms will be Canadian controlled within the decade. The Government of Canada intends to acquire several of them.

As a result of the new Program, existing Canadian firms, encouraged by the incentives, will grow and prosper. Canadian firms not yet involved in this sector will be encouraged to enter. There will still be an important place for foreign owned firms. Canada will remain open to foreign investment and skills. Over time, however, Canadians—companies and individuals—will become the major actors in the petroleum sector.

The National Energy Program also opens substantial new opportunities for Canadians in sectors other than energy. Energy-related investment will have spin-off effects that will stimulate the overall level of economic activity and foster rapid growth of businesses across the country, providing goods and services to the energy industry. One of the most promising areas in this respect is the Atlantic off-shore. There, a projected multi-billion-dollar petroleum investment surge could, with the framework established by the Program, revolutionize the industrial and employment outlook of the region.

This Program clearly makes a fundamental change in the ground rules governing the petroleum industry. While the impact in aggregate terms—for the industry, and for Canada—will be positive, there may be adverse reaction from some companies, who will perceive a deterioration of their relative position and prospects.

In this context, it is essential for Canadians to recognize the essence of the new price, tax, and incentive system. It redirects a flow of windfall revenues that would otherwise have accrued on existing production, produced mainly by the bigger, foreign-owned firms, to firms and individuals prepared to explore aggressively for new oil sources. In doing so, it contributes to both Canadian ownership and energy security goals. On the evidence to date, Canadian companies can readily take up any slack, should there be a faltering of the efforts of the large foreign-owned concerns.

Therefore, the Government of Canada is convinced that greater Canadian control of the industry will lead to an *improvement* of Canada's oil outlook; there will be a stronger commitment to domestic goals and priorities, and more responsiveness to needs such as increased domestic content in research and development. This will be particularly true in the case of companies acquired by the Government of Canada, which will become explicit instruments of national policy.

Energy Fairness

A major purpose of the National Energy Program has been to establish a pricing and revenue system in oil and gas that distributes fairly the benefits from Canada's energy endowment. This means a system that is fair to:

- The consumer in terms of oil and gas prices, and in terms of the help provided by the Government of Canada to Canadians, so that they can

play their part in achieving our energy goals;

- The producing provinces, by ensuring that they enjoy substantial and growing revenues from their resources; and
- All Canadians, by providing the Government of Canada with the fiscal capacity to fulfill its national responsibilities.

The Consumer

The National Energy Program involves higher prices to the consumer for both oil and gas. This is inevitable. The producing provinces are entitled to growing revenues from the sale of their resources. The producing industry needs sufficient cash, and the prospect of higher prices. Success of conservation efforts depends heavily on the pressure of rising prices. Still, the Program provides for substantially lower prices than those paid by consumers anywhere else in the industrialized world. The Government of Canada promised that prices would rise moderately, from a base that—by world standards—is exceptionally low. This commitment to oil consumers has been met. Canadian energy consumers,

Estimated Consumer Energy Costs

Vehicle Use	
At average 1980 levels of consumption	
Motor gasoline (1980)	$695
Motor gasoline (1984) world level prices	$1,770
Motor gasoline (1984) N.E.P.	$1,240
N.E.P. prices (1984) with a 20% improvement in fuel efficiency	**$990**

Home Heating	*At 1980 Consumption Levels*	*With a 25% Energy Saving Through CHIP or HIP*
Winnipeg, Manitoba		
Fuel oil (1980)	**$680**	
Fuel oil (1984) world level prices	$1,930	
Fuel oil (1984) N.E.P.	$1,280	$960
Electric heating (1984)	$965	$725
Natural gas (1984) N.E.P.	$710	**$535**
St. John's, Newfoundland		
Fuel oil (1980)	**$810**	
Fuel oil (1984) world level prices	$2,245	
Fuel oil (1984) N.E.P.	$1,525	$1,145
Fuel oil (1984) N.E.P. with enhanced conservation program	$1,145	**$760**

wherever they live—in the west, in the east or in central Canada—are the real winners in this Program.

The National Energy Program will benefit consumers in three ways. Domestic oil prices will be made-in-Canada on the basis of Canadian cost conditions and will, therefore, be substantially less than international prices. The Program also provides generous financial assistance to consumers converting from oil to more plentiful and less expensive domestic fuels. And, the Program reinforces and expands existing federal assistance for conservation throughout Canada, and particularly in regions where alternatives to oil use are not feasible. Through these measures, the National Energy Program provides time and financial assistance for consumers to curtail their oil use, and thereby reduce the burden of future oil costs.

An international perspective is useful to illustrate in concrete terms how Canadian consumers benefit from a price system that distributes widely the benefits of Canada's energy endowment. In 1980, a typical Canadian consumer would spend $1,375 to heat his home with fuel oil and purchase gasoline for his automobile. This would cost an estimated $3,700 in 1984 if domestic oil prices were at international levels. Under the National Energy Program, this amount of energy would cost $2,520 in 1984, $1,180 less than with world-level prices

Nevertheless, costs to Canadian consumers will be significantly higher than they are in 1980. Consumers should therefore take advantage of the assistance offered under the Program, to reduce their energy costs by switching from oil and conserving all forms of energy.

The federal government will match consumers' expenditures on conversion equipment with a taxable grant of up to $800. Conversion from oil will reduce consumers' heating costs substantially. Consider, for example, an average Winnipeg household. A switch from oil would reduce its 1984 home heating bill by $325, if the conversion is to electricity, and by $570 for a conversion to natural gas. The household's heating bill for natural gas in 1984 would be approximately equal to its 1980 fuel oil bill.

The expenditures projected in the above examples assume that energy consumption for household and transportation uses in 1984 will be the same as in 1980. This, of course, need not be the case. With elements of the National Energy Program, including legislation to establish automobile fuel efficiency standards, fuel used in passenger vehicles is expected to decline by 20 per cent from 1980 to 1984. To address the consumer's costs of home heating, the Government of Canada provides up to $500 in grants to Canadians investing in home insulation. For an average home, insulation prompted by these federal programs could yield an energy saving of about 25 per cent. This would reduce 1984 home heating bills by $320 for those heating with oil, $240 for those on electricity, and $175 for those on natural gas.

As a result of such measures, the Winnipeg household's 1984 electric heating bill would be nearly as low as its 1980 fuel oil bill, and its 1984 gas heating bill would be substantially below the costs that it would have incurred, had it stayed with oil heat.

In Newfoundland, Prince Edward Island and the northern Territories, where gas will not be available and electricity is very expensive, the federal government will implement an enhanced conservation program as an alternative to the conversion assistance available across Canada. Together with HIP or CHIP, this program should yield oil savings of about 50 per cent compared with 1980 consumption. This would reduce the 1984 cost of home heating in Newfoundland, for example, to $760; less than the average 1980 fuel oil bill ($810) in that province.

To achieve these energy savings, consumers must match federal financial assistance for conversions and enhanced conservation. However, these consumer investments will be paid back rapidly in reduced home heating bills. A household's investment at the end of 1982, for example, would be paid back in about three years in the case of conversion to electricity in Winnipeg or for enhanced conservation measures in Newfoundland. The expenditure to convert, in 1982, to natural gas would be recouped in less than two years.

Given the extent of savings in energy bills, these expenditures are probably the best private investment opportunity in Canada. The pay-back will be quick, and the investment will continue to pay dividends in energy savings long into the future. At the same time, these expenditures represent a valuable investment in Canada's energy future; they will help make possible achievement of the objective of securing independence from the world oil market.

The Producing Provinces

The National Energy Program establishes a basis for the Government of Canada to obtain a more equitable share of the revenues associated with oil

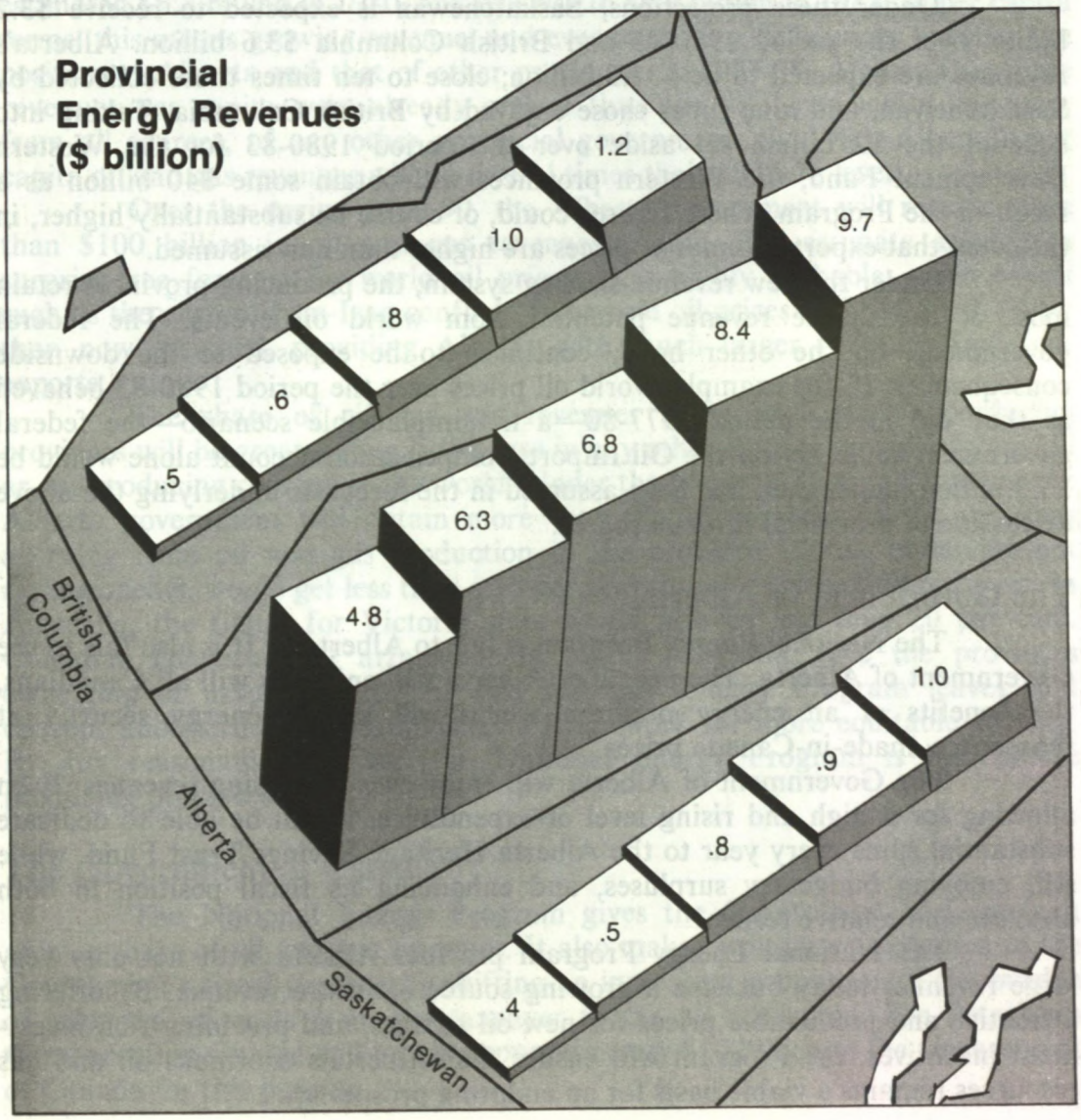
Estimated Revenues From Oil and Natural Gas Production

	1979	*1980*	*1981*	*1982*	*1983*	*1980-83*	
				($ billions)			
Federal							
Revenues	1.4	2.3	5.3	7.4	9.0	24.0	
Incentive Payments	–	–	0.6	0.9	1.0	2.5	
Total	1.4	2.2	4.7	6.5	8.0	21.5	(24%)
Industry*							
Cash flow	4.6	6.1	5.9	7.3	8.2	27.5	
Incentive Payments	–	–	0.6	0.9	1.0	2.5	
Total	4.6	6.1	6.5	8.2	9.2	30.0	(33%)
Provinces*							
Alberta	4.8	6.3	6.8	8.4	9.7	31.2	(35%)
Saskatchewan	0.4	0.5	0.8	0.9	1.0	3.2	(4%)
British Columbia	0.5	0.6	0.8	1.0	1.2	3.6	(4%)
Total	5.7	7.4	8.4	10.3	11.9	38.0	(43%)

*Industry and provincial shares assume land bonus payments are included in provincial share, and deducted from industry share. If the land bonus payments were excluded from the provincial share and left in the industry share, over the period 1980-83, industry's share under the National Energy Program would be 39%; the provincial share would be 37%, the same as in 1979. The federal revenues include both the corporate income tax on oil and gas production income and the federal share of the oil export charge.

and gas. However, it does so in a way that answers the objections of the governments of the producing provinces. By deciding against an export tax on natural gas, the Government of Canada has removed an element which the governments of Alberta and British Columbia found particularly troublesome; it also leaves those provinces with most of the upside potential from higher export prices. The new system also involves a sharing of the proceeds of the federal crude oil export charge.

The domestic wellhead price of natural gas will not rise in 1981. This reflects the fact that gas netbacks have risen much faster than those for oil, despite a growing surplus of gas and a desire to encourage preferentially the search for oil. A one-year gas price pause will improve price relationships, without significant harm to the gas producing provinces, who will continue to enjoy the benefits of the flowback from the lucrative export market.



Saskatchewan regarded the previous export tax system as unfair. The National Energy Program addresses Saskatchewan's concerns, by sharing the tax proceeds equally with the province. In addition, the Program supports major new energy investments such as a heavy oil upgrader in the province, and establishes an important R & D program for heavy oil, so that Saskatchewan's longer-term energy base is secured.

Under the framework established by the National Energy Program, all of the producing provinces will experience growing revenues from oil and gas. The exact level of those revenues will depend on such factors as gas export volumes and the world oil price. The Government of Canada has developed revenue projections that are premised on an expectation that world oil prices do not rise dramatically—as they did, for example, in 1979. The projections also assume that export volumes will be significantly below authorized levels.

Under these projections, Saskatchewan is expected to receive $3.2 billion over the period 1980-83 and British Columbia $3.6 billion. Alberta's revenues are expected to be $31.2 billion; close to ten times those collected by Saskatchewan, and nine times those enjoyed by British Columbia. Taking into account the $2 billion set aside over the period 1980-83 for the Western Development Fund, the Western provinces will obtain some $40 billion as a result of the Program. These figures could, of course be substantially higher, in the event that export volumes or prices are higher than now assumed.

Under the new revenue-sharing system, the producing provinces retain most of the upside revenue potential from world oil events. The federal government, on the other hand, continues to be exposed to the downside consequences. If, for example, world oil prices over the period 1980-83 behaved as they did in the period 1977-80—a not implausible scenario—the federal government's liability on the Oil Import Compensation account alone would be $5.3 billion higher than has been assumed in the forecasts underlying the above discussion of provincial revenue shares.

The Government of Alberta

The National Energy Program is fair to Albertans. It is also fair to the Government of Alberta. The people of Alberta will enjoy, as will all Canadians, the benefits of an energy program which will deliver energy security at reasonable, made-in-Canada prices.

The Government of Alberta will enjoy ever-increasing revenues. Even allowing for a high and rising level of expenditure, it will be able to dedicate substantial sums every year to the Alberta Heritage Savings Trust Fund, while still enjoying budgetary surpluses, and enhancing its fiscal position in both absolute and relative terms.

The National Energy Program provides Alberta with not only very large revenues today but also a growing source of future revenue. By offering attractive and predictable prices for new oil sources, and providing rich investment incentives, the Program will ensure that Alberta's enormous oil and gas resources remains a viable basis for an enduring prosperity.

In 1977, the Alberta government's revenue from royalties and provincial income tax on oil and gas production was $2.4 billion. In addition, the government earned $700 million in land bonus payments. In total, its oil and gas revenue was $3.1 billion. Even in 1977, Alberta was considerably richer than any of the other provinces. Saskatchewan's total oil and gas revenue was $270 million, British Columbia's $410 million. In per capita terms, Saskatchewan's revenue was $288, British Columbia's $164. Ontario's total resource revenue was only $20; Quebec's $18; Nova Scotia's $7. Alberta's was $1,635. Thus, Ontario's total resource revenue per capita was 1.2 per cent of Alberta's per capita oil and gas revenue. Indeed, Ontario's total revenue from all sources was $205 less per capita than Alberta's revenue from oil and gas alone.

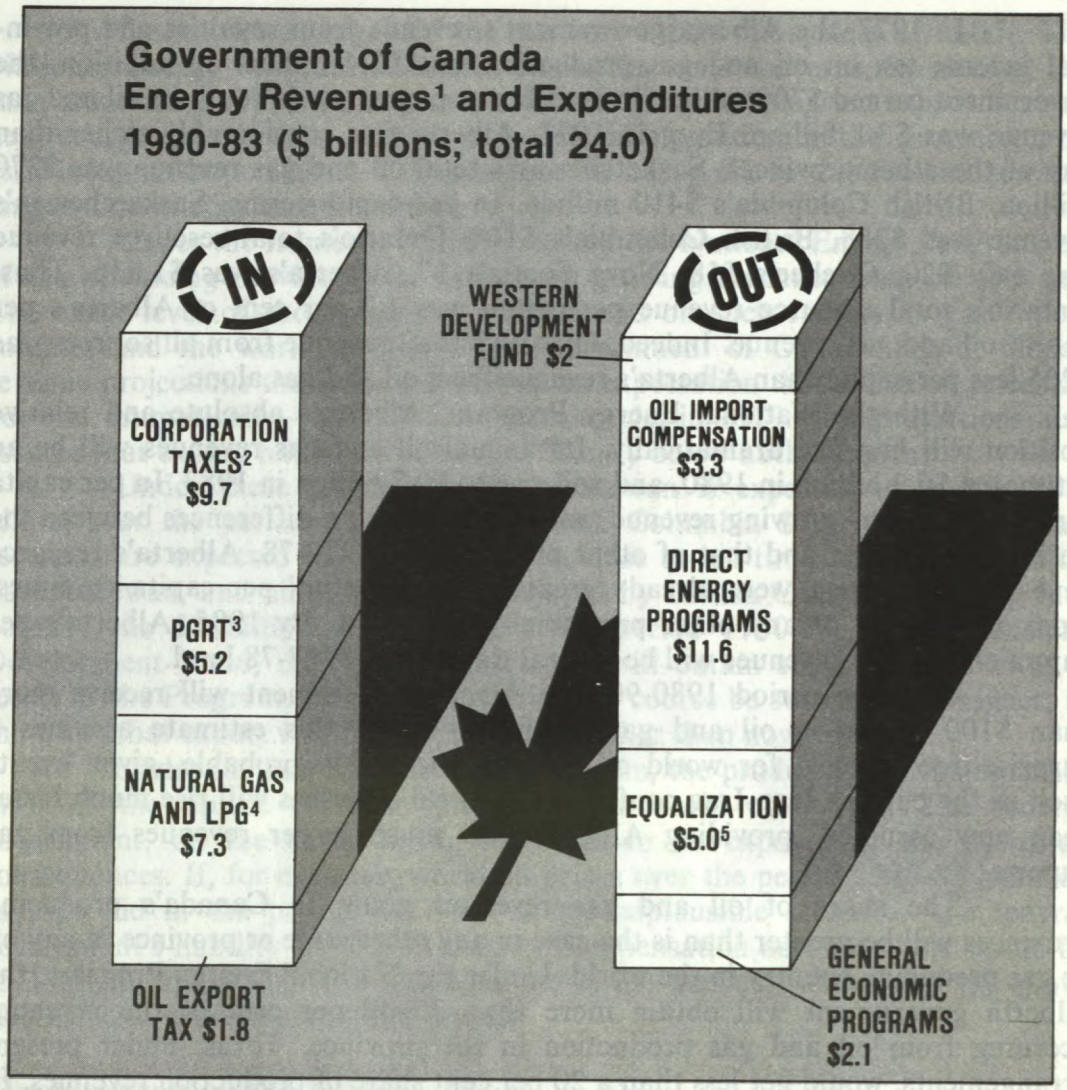
With the National Energy Program, Alberta's absolute and relative position will improve dramatically. Its annual oil and gas revenues will be an estimated $6.3 billion in 1980, and will rise to $9.7 billion in 1983. In per capita terms, this means growing revenue, and ever-increasing differences between the position of Alberta and that of other provinces. In 1977-78, Alberta's resource revenues per capita were already greater than the total per capita revenues, from all sources, of any other provincial government. By 1985, Alberta's per capita oil and gas revenues will be several times their 1977-78 level.

Over the period 1980-90, the Alberta government will receive more than $100 billion in oil and gas revenues. Again, this estimate assumes a surprise-free forecast for world oil prices. It is highly probable, given events such as the current Iran-Iraq conflict, that world oil prices will rise much faster than now assumed, providing Alberta with much larger revenues from gas exports.

The share of oil and gas revenues going to Canada's producing provinces will be greater than is the case in any other state or province in any oil or gas producing country in the world. Under the National Energy Program, the Alberta government will obtain more than 35–40 per cent of the revenues accruing from oil and gas production in the province. Texas, under present arrangements, would get less than a 20 per cent share of production revenues. In Australia, the figure for Victoria state would also be less than 20 per cent. Canadian constitutional arrangements, as in Australia, give the provinces ownership of natural resources. The National Energy Program leaves that concept undisturbed, but establishes a framework for more equitable sharing. By any reasonable measure, the National Energy Program is fair to the producing provinces.

The Government of Canada

The National Energy Program gives the Government of Canada a greater share of oil and gas revenues. It also makes a major contribution to the Government's fiscal position by shifting an increasing proportion of the burden of imported oil costs from the taxpayer to the oil consumer. The Petroleum Compensation Charge will provide approximately $10 billion to the Government of Canada for this purpose.



[1]Revenues from crude oil and natural gas sales.
[2]Corporation income taxes on upstream profits.
[3]Petroleum and Gas Revenue Tax.
[4]Includes $1 billion from net Petroleum Compensation Charge receipts.
[5]Includes only equalization payments related to provincial revenues from petroleum production.

The Government of Canada will obtain an estimated $24 billion over the four years 1980-83 from crude oil and gas tax revenues. The National Energy Program involves direct energy expenditures of $11.6 billion over the same period. Over this period, the Western Development Fund will cost a further $2.0 billion. In addition, the Government will pay about $3.3 billion in subsidizing those costs of imported oil which are not covered by the Petroleum Compensation Charge. As part of the equalization program, the Government of Canada will pay out $5 billion to the provincial governments to help equalize resource revenues. More than $21.9 billion, or over 90 per cent of the revenues, will be spent on initiatives arising out of the National Energy Program. The remaining $2.1 billion will be used to support the government's general economic program.

Conclusion

In the Speech from the Throne, the Government of Canada promised early action to address Canada's energy problems, and to ensure that Canadians everywhere had the opportunity to share in the benefits of Canada's energy strength. At the Summit meeting in Venice, the Government of Canada joined other major powers in a promise to intensify efforts to improve the world energy situation, and to help the less-developed countries that have been badly hurt by the new oil realities. The National Energy Program fulfills all of those promises.

Canadians have a right to energy security. The present feeling of vulnerability to the energy crisis is unnecessary. Canada has the energy to be secure, and our constitution ensures that all Canadians—wherever they live—have fair and unhindered access to that energy.

The Canadian energy situation is manageable and the Government of Canada is determined to see that it is well managed. Decision is essential now to end prolonged debate, and to create the certainty required for renewed investment and growth.

In appealing to all Canadians to examine this program—and it affects all, and some profoundly—the Government appeals also to their sense of national security, national opportunity, and national fairness in equalizing our energy endowment.

It appeals, too, for broad public participation in energy management, a difficult task that must stretch beyond governments and industry to involve every citizen in his or her role as an energy consumer.

The goal is to achieve energy security within a decade.

This country already produces more energy than it consumes. We have surpluses of natural gas, electricity, and other forms of energy, and the challenge now is to use them effectively to displace as much oil as possible, ending our reliance on foreign sources of petroleum.

While the program includes massive stimulus to new oil and gas exploration and development, it recognizes the reality of declining conventional oil supplies in Western Canada and the potential folly of striking national policy on the basis of a promise, no matter how encouraging, of new supplies.

In such circumstances, the sensible policy is to reduce oil demand through both conversion and conservation, and to base this approach on the enlightened self-interest of every consumer. The rationale for such action is economic, whether in the broad national sense or in the context of operating a whole industry or one small household.

Some may find surprising the emphasis on energy demand management as a critical factor in achieving energy security. In a country so rich in energy resources it is tempting to rely exclusively on a supply solution, to stake our future on the hope of large oil discoveries. But this is one of the reasons why Canada now finds itself in the paradoxical position of oil import dependence and energy richness. Ignoring opportunities to manage our energy demand in a way which reflects conservation objectives and the broad array of our energy endowment, is to keep ourselves on a treadmill. The energy initiatives in the

National Energy Program will save about 800 million barrels of oil over the decade, compared to previous policies. The saving is clearly worthwhile to Canada. Moreover, in contrast to finding and producing oil, saving oil involves investments in every region of Canada, by every household, giving virtually every Canadian a personal stake in the achievement of energy security.

Is the goal attainable? The answer, in large measure, will come in the form of responses by the millions of households across Canada, to whom the Government of Canada offers rich incentives to contribute to energy security for Canada. The answer will also come from the energy industry, increasingly Canadian, as it accelerates its efforts to find new petroleum supplies for Canada.

The National Energy Program has a horizon that stretches beyond this decade. Increasingly, energy security will require new and more efficient energy-using structures, and a new mixture of fossil fuels and renewable forms of energy. It is towards that objective that the Program offers solid new encouragement to energy research, development, and demonstration.

Meanwhile, Canada can capitalize on one more strength inherent in our energy situation—the time, denied to many other industrial nations, to choose carefully from a wide array of energy options such as coal, nuclear power, new liquid fuels and others, without having to rush headlong into projects that might compromise our social and environmental goals.

The National Energy Program addresses more than energy issues. It brings substantial new opportunities for Canadians in sectors other than energy. Energy-related investment will have spin-off effects that will improve the overall level of economic activity and foster rapid growth of businesses providing goods and services to the energy industry. The Program has been carefully designed to stimulate activity and employment in all of the regions of Canada. In addition, oil and gas prices under the Program will have relatively moderate effects on the costs of production and transportation, thus providing a significant competitive advantage to Canadian industries. Yet, all oil users will have the certain knowledge that prices will rise substantially, over time, so that plans and adjustments can be made.

The advantage provided by moderate price levels is a way of translating Canada's energy wealth into overall economic improvement. It must not be dissipated. The Government of Canada expects the full benefit of lower energy costs to be reflected in the well-being of every worker, every citizen, through economic growth and new employment opportunities. These low costs should not be used as an excuse for inadequate attention to increasing productivity or improving energy efficiency. A made-in-Canada oil price is not a licence to waste oil. It would be unfortunate—indeed, unacceptable—if the benefits of our resource endowment were squandered in this way.

It would also be unacceptable if the benefits of made-in-Canada prices were captured in the form of extraordinary profits by the refining or petrochemical industries, which provide the basic fuels and chemical building blocks to our economy. The Government of Canada will be especially vigilant to ensure

that the domestic prices of these commodities are consistent with the costs of the oil and gas used to make them. It will also expect all Canadian industries, in return for the substantial benefit of secure, reasonably-priced energy, to pursue vigorously the opportunities for growth that Canada needs. Our industrial competitors, forced to adjust to world energy prices, will do so. We cannot expect to compete in tomorrow's world unless we use the respite and the certainty afforded by the price schedule in the Program to put in place energy-efficient processes, and to develop energy-efficient products.

Canada is rich in energy resources, wealthy in the skills needed to develop them, and strong in its determination to use them for the benefit of all Canadians. Energy can be a major force, both economically and politically, to unite us and make us prosper. All Canadians want this. All Canadians want a solution to our problems which is not only acceptable to all, but fair to all. The Government of Canada recognizes its special responsibility as the government of all Canadians to find such a solution. The time has come to put an end to a debate which has divided us, and to build an energy future that will unite us. The National Energy Program means making more efficient use of our energy for Canadians and by Canadians. It means bold decisive steps, not generalities; practical programs, not just ideas; rapid and concrete measures to resolve problems, not pious hopes. It means security, opportunity, and fairness.