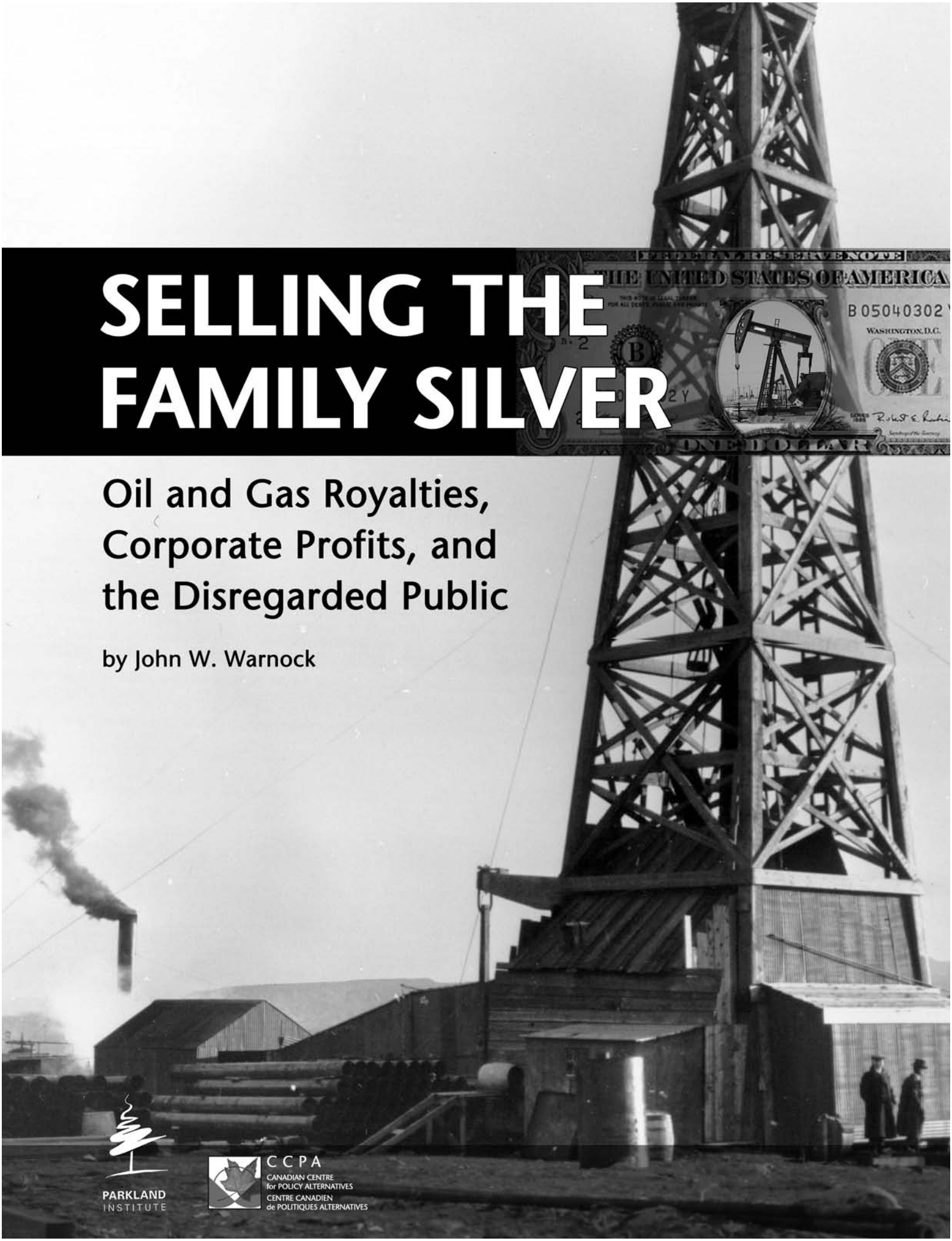

SELLING THE FAMILY SILVER

Oil and Gas Royalties, Corporate Profits, and the Disregarded Public

by John W. Warnock

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November 2006

ISBN: 1-894949-12-9

Published by: Parkland Institute
and Canadian Centre for Policy
Alternatives - Saskatchewan Office

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Acknowledgements

The author would like to thank the following people for reading earlier drafts of this paper and providing helpful comments and suggestions: Ricardo Acuña, John Dillon, Diana Gibson, John Keen, Gordon Laxer, John McClement, Joe Roberts, Rick Sawa, David Thompson, and Ed Whelan. The author accepts full responsibility for the final text.

Special thanks goes to Lynn Gidluck and Yolanda Hansen for editorial work and other support on this project. Additional thanks to Christine Peters for cover design and layout of this publication.

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Executive Summary

Introduction

The world of oil and gas is split between industrialized consumer countries and their oil corporations, and less developed producer countries, many of which are former colonies. Canada is somewhat unique, as a relatively wealthy country in a close relationship of dependency with the United States, which consumes the majority of our production, and whose oil companies dominate our industry.

For a time – mainly in the 1970s – Canadian governments accepted public opinion about foreign control of this sector, and took action. The Alberta and Saskatchewan governments raised royalties and placed the proceeds in Heritage Funds. Saskatchewan created Sask Oil and Sask Power (which managed natural gas). Federally, Petro-Canada was created, with a head office in Calgary.

More recently, governments have undone these reforms, privatizing publicly-owned energy companies, returning us to an era of foreign, private-sector domination, reducing royalties and gutting heritage funds. The predictable outcome has been rapid depletion of these non-renewable resources, and increased greenhouse gas emissions. Canada is now past its peak in conventional oil and gas production, and the increasing exploitation of unconventional replacements – tarsands and coal-bed methane – bears heavy social, economic and environmental costs.

This paper explores the development of the sector, globally and in Canada, and the resulting modern geopolitics of oil. It discusses the environmental costs, and the fiscal and royalty structures that capture (and fail to capture) economic rents for the public that owns the resource. It examines the issues in more depth with a case study of Saskatchewan. With this context and background, it sets out the need for a new policy direction – one that puts the interests of our populations ahead of service to corporate profits and the military and consumer demands of the United States.

The geopolitics of oil

Four periods characterize the geopolitical development of the industry. In the first period, up to the mid 1970s, private sector "Independent Oil Companies" (IOCs) with vertical integration dominated the industry, working closely with their western imperial governments to secure their access to oil reserves. In the second period, former colonies pursuing national development programs strengthened OPEC and created publicly-owned "National Oil Companies" (NOCs). In the third period, from about 1980 to 2000, IOCs and their governments used debt crises to force privatization of NOCs, while reducing royalties in home countries.

The current period is one of growth in the importance of NOCs. While IOCs dominate the sales of petroleum products, NOCs dominate production. China and India have become major importers, and the global influence of their NOCs is rising quickly. Russia's NOCs and IOCs are also becoming more important. Venezuela's NOC has been re-energized, and has helped develop regional ties in the sector. NOCs have begun operating in other countries, and there is a growing reluctance among producing nations to sign agreements with IOCs. NOCs now control 77 percent of the 1.1 trillion barrels of global proven oil reserves.

The conflict today between IOCs and NOCs reflects the conflict between consuming states (mainly imperial powers) and producing states (mainly less developed countries). The OICs are vertically integrated, and have thus been able to effect transfer pricing. As they move oil from production through to processing and sales, they set the prices for transfers internally, at non-market rates. Thus they are able to move profits to low-tax jurisdictions, and costs to relatively high-tax jurisdictions. They also exercise market power, and through barriers to market entry, their oligopoly has kept prices high. The IOCs have undergone major consolidation in recent years, 1997s top 20

IOCs becoming just seven by end of 2003.

Economic rent and fiscal regimes

Economic rent is the financial surplus created by the exploitation of natural resources, over and above the costs of exploitation (which include "normal" profits). In the oil and gas industry today, there is a very large rent, and IOCs and their investors expect to accumulate most of it.

The democratic theory of rent suggests that governments should maximize their collection of rent to the benefit of their publics, who own the resources. The liberal theory of rent suggests that public resources should be privatized and employed to make profits, and that rents should remain in private hands either entirely, or enough to ensure investment in the industry.

Income to OPEC countries increased 46.4 percent, while almost all windfall profits in Canada and the US went to private corporations.

Economic rent is most easily captured for the public interest when resources are developed through state-owned enterprises. The success of such enterprises depends on the degree of democracy achieved by that jurisdiction, but those in advanced democracies are well-run and provide greater returns to the public than private corporations. Joint ventures between NOCs and IOCs also enable governments to extract reasonable rents for the public. During the last few years of large oil price increases, income to OPEC countries increased 46.4 percent, while almost all windfall profits in Canada and the US went to private corporations.

In the oil and gas industry, rents are extracted by a number of different methods, including fees for prospecting, bonus bids for exploration, discovery and production, and royalties or production fees (based on volume of production or value). Today there are limited areas where large pools of oil and gas can be found, and competition for access is keen. Thus governments are increasingly seeking a percentage of the oil and gas produced, via *production sharing agreements*. In some countries, governments take equity positions; such *joint ventures* mean that government provides capital, and shares in the risks and the profits.

The private industry dislikes production royalties and bonuses, and prefers a system based solely on taxing profits, thus enabling it to employ transfer pricing. In order to curtail tax avoidance, some countries have had to introduce a minimum tax, *a progressive profits tax* (PPT, akin to progressive individual income tax), *a resource rent tax* (RRT, a tax on cash flow), or an excess profits tax. Nonetheless, through generous depreciation allowances, tax holidays, investment tax credits, resource allowances and other tax incentives, energy corporation taxable incomes are often a very small percentage of gross revenues.

Offshore tax havens enable even greater tax avoidance. An illustration of the problem comes from energy giant Enron, which had hundreds of subsidiaries registered offshore in havens with zero corporate taxes. A web of respectable auditing firms, law firms and banks helped it avoid taxes with paper transactions such as:

- selling oil to a subsidiary in a tax haven for a very high price and re-exporting it at the market price
- shifting capital to an offshore subsidiary and they borrowing it back at a high interest rate
- transferring the ownership of patents and services to the offshore company and then paying large royalties for their use
- buying inputs from offshore companies at highly inflated prices

Such tax avoidance practices are common in business circles, and by 2003, 58 percent of US corporate profits were taken in offshore tax havens. In Russia, similar schemes and firms were used to avoid oil company taxes of around $9 billion per year.

Canadian oil industry

Global developments have had their impact on the Canadian industry, which has always been dominated by foreign-owned corporate giants. A few large Canadian firms have emerged, such as EnCana, Petro-Canada and Suncor, but industry analysts note that the majority of their stock is now owned by citizens of the United States.

Prior to the discovery of Alberta's Leduc Field in 1947, almost all the oil consumed in Canada was imported. The large refineries were all owned and controlled by foreign-owned majors, and they had a lobby group, the Canadian Petroleum Association

(CPA). As Alberta's industry developed, Canada emerged with two markets: Western Canada and parts of the US and the Eastern Canadian market.

The Canadian corporations formed their own lobby group, the Independent Canadian Petroleum Association (ICPA), and lobbied Ottawa to require eastern markets to accept more expensive Alberta oil. The Conservative government agreed, though caving in somewhat to lobbying by the CPA and the majors. The result was the National Oil Policy of 1961, which decreed markets east of the Ottawa River would continue to be served by the majors. Alberta's more expensive oil would be sold at all points west of the Ottawa River. Essentially, Ontario residents would support the growth of Alberta oil corporations.

In 1975, the Federal government created Petro-Canada, and in 1980 established the National Energy Program. The aim was to increase public and broader Canadian ownership of the industry. The oil corporations, the business press, the Reagan administration, and Alberta's Conservative government were all strongly opposed. Eventually these reforms were all undone, with the privatization of Petro-Canada and the development of continental trade deals.

Canadian royalties are among the lowest in the world at an average $0.23 per barrel.

The Canada-U.S. Free Trade Agreement in 1987 surprised many, including provincial premiers, by its inclusion of a continental free trade agreement in energy. The Agreement ceded Canada's sovereignty dramatically. The federal government was prohibited from reducing Canada's exports, even in times of energy shortages (the "proportional sharing clause"), prohibited from controlling transfer pricing, and prohibited from setting export prices and taxes, among other things. These prohibitions were strengthened in the subsequent North American Free Trade Agreement (NAFTA).

World oil prices have risen dramatically in the last few years, more than doubling to over $70 per barrel at times. These price increases are entirely unrelated to production costs; in 2003 Canadian production costs, including royalties, averaged $5.57 per barrel. Even with higher costs and relatively lower oil prices in the tar sands, prices are still well in excess of costs.

Because of the cuts to royalties and taxes as well as the move away from national or public ownership in Canada, the private oil industry has enjoyed windfall profits, as have the gas companies. According to the US Energy Information Administration, Canadian royalties, are among the lowest in the world at an average $0.23 per barrel. The result of high prices and low royalties and taxes has been a very high return on equity, rising to 22.4 percent in 2005 and making the oil and gas industry the most profitable sector in Canada.

The oil industry in Saskatchewan

Most oil extracted in Canada comes from the Western Canadian Sedimentary Basin (WCSB). This basin is considered "mature," as the extraction of conventional light and medium oil has been declining for a number of years. The extraction of light crude in Saskatchewan peaked in 1997, while medium extraction peaked in 1998. Heavy oil is now the majority of oil extracted in Saskatchewan. At the same time, recent drilling in Saskatchewan has focused more on extracting from existing pools rather than finding new sources.

The majority of Saskatchewan's oil production – 73 percent - is exported to the US. And although the industry contributes 6 percent of the province's GDP, that proportion is falling, and it only contributes 0.5 percent of provincial employment. While the value of Saskatchewan oil sales has gone from $3.6 billion to over $30 billion, royalties have slipped from over 56 percent to less than 16 percent. Prior to 1985, Saskatchewan was in a period of increasing royalties. During this time, Saskatchewan's royalties were higher than Alberta's and yet there was no capital flight from Saskatchewan. However, since 1986 royalties in Saskatchewan have dropped along with Alberta's. And a plethora of newly-created categories of oil has enabled further reductions in the overall level of royalties collected. These changes have resulted from regular negotiations between government and industry, and this process has always excluded the public and any public input.

The natural gas industry

Conventional natural gas production peaked in the United States around 1973, and despite development of Coal Bed Methane (CBM), the volume of

reserves has steadily declined. US reserves in 2003 were 40 percent lower than in 1990, and CBM reserves amount to 18tcf, less than one year of annual consumption. To fill the growing gap, imports from Canada were increased, but despite increased drilling in both the US and Canada, North American gas production has been flat since 1997. Canada's production peaked in 2001, and average production rates for new wells have dropped by two-thirds since the early 1990s.

The US Energy Information Agency characterizes the American situation as a "natural gas crisis". And despite the massive price increases in the past few years, the Canadian Energy Research Institute predicts that Canadian natural gas prices will triple in the next 13 years. In the Western Canada Sedimentary Basin (WCSB), reserves of natural gas peaked in 1984 and have been declining since. And Natural Resources Canada projected that Saskatchewan will peak in 2005 and drop by 70 percent in the following 15 years – an alarming prospect given the province's dependence on gas for home heating. Although environmentally-damaging CBM will help prolong production in Canada, it will not make up for the decline in conventional sources.

As imports from Canada fall off after 2010, US imports of liquefied natural gas (LNG) are expected to rise. LNG "trains" rely upon liquefying natural gas, transporting it, and regasifying it, and the costs are significantly higher than for regular natural gas. Developing the infrastructure – the liquefying and regasifying plants, transport ships and pipelines, is expensive and risky.

Meanwhile, the industry is doing quite well with higher prices despite short term fluctuations. The US Department of Energy date confirms that the bulk of the economic rent from natural gas extraction is going to the owners of oil and gas corporations. In the WCSB, conventional natural gas production is allowing the industry to capture 27 percent to 53 percent of the market price as rents. Royalties in Saskatchewan are quite low on a global scale, averaging less than 14 percent of sales in recent years, while many countries get 50 percent or more.

Conclusions

In the last 20 years, Canadian governments have gone along with the policy demands of the major and super-major IOCs. They have reduced royalties, increased exports, avoided addressing global warming and other environmental costs of fossil fuel consumption, and ceded control over the resource.

A better government policy would put the public interest ahead of corporate profits. It would place a high priority on securing energy supply for future generations. It would maximize returns to the general public on the sale of the resources. It would address greenhouse gas emissions and the social, economic and environmental costs of global warming. It would develop alternative energy sources. It would recognize that fuelling America's addiction to fossil fuels is wrong, and that exports to the US cannot continue to rise.

The Saskatchewan example illustrates that there are many policies a government willing to protect the public interest could implement. These policies are not radical, and in some cases have been employed with success in the past. The following are a few suggestions.

- Create a provincial energy conservation board to cover these industries. All sales would be made to this agency, allowing public control over sales, prices, profits, resource rents and a level of proven reserves to be held for future generations.
- Raise royalties up to the level that they were during the Saskatchewan government of Allan Blakeney, which was around 50 percent of sales - a common rate around the world today.
- Implement an excess profits tax, as several countries have done recently.
- Merge SaskEnergy with SaskPower and give it control over natural gas development and distribution within the province. The priority would be to conserve natural gas for present and future generations.
- Re-establish the Heritage Funds, allocating at least 50 percent of the royalties from the depletion of oil and gas to them, and invest in renewable energy development.
- Re-create SaskOil as a Crown corporation with the goal of gaining ownership and control over the remaining provincial oil reserves. Require all future developments to include the right of SaskOil to 50 percent ownership.

Introduction

Over the past few years there has been a dramatic increase in the international price for oil and gas. The price inflation has generally been attributed to the world economic boom and the rise in the demand for oil by China and India. Limited refining capacity has been cited as a contributor to the high rise in gasoline prices. Costs have also gone up as it has become much more difficult for the oil companies to find new reserves of both oil and gas. Many of the older oil and gas fields are being depleted, conventional sources are shrinking, and new supply is being provided by non-conventional reserves, which are considerably more expensive to develop. Nevertheless, the price inflation has generally been far above the increase in the cost of extraction and has resulted in very large profits for private oil and gas corporations.

There is an important factor that has not been widely discussed; less and less global oil and gas is accessible to large private corporations. Most of the remaining conventional oil reserves are in less developed countries that have national oil companies and higher royalties and taxes. The trend in many of these countries has been towards greater national control over extraction through national oil companies and towards increased royalty and tax rates. Access by the large private corporations has been restricted, and their gross profits from extraction in these areas have been reduced.

Today the world of oil and gas is basically divided between the industrialized countries and their large transnational oil corporations (TNCs), and the countries with most of the remaining reserves (mainly less developed countries, many of which aare former colonies).Oil and gas have been the key to the development of industrial societies. They also play a central role in all world military systems. Because the advanced industrialized capitalist countries have had a shortage of these resources, access to them has been a central focus of imperialism, colonialism and political domination.

The western industrialized countries want an open world economy where their private corporations can gain access to supply with little government interference. These countries, members of the Organization for Economic Co-operation and Development (OECD) and the International Energy Agency (IEA), insist that their private corporations have a right to maximize profits from their operations in the less developed countries. They use their collective political and economic power to try to set the development agenda and rules.

On the other side of this division are the producing countries, many of whom are members of the Organization of Petroleum Exporting Countries (OPEC). They have established government control over their resources and have created state-owned national oil corporations (NOCs) to develop their resources. While they engage in operations with the international private corporations, they assert government sovereignty over their oil and gas resources. Their objective is to fully develop oil and gas resources but to claim as much of the economic rent as possible from extraction for their own populations.

Where does Canada fit into this world division? One the one hand, Canada is a major source of oil and gas, an important producing country. However, we are also an advanced industrialized country with close ties to the former colonial powers. As a major producing country Canada has been an outlier. In practice, Canada's governments, urged on by our very influential business organizations and political pressure from the US government, have chosen to follow the IEA road. Instead of increased public ownership and higher royalties, Canada has deepened trade agreements with the US that reduce national control over oil and gas and removed all limits to foreign ownership. PetroCanada was recently sold off and SaskOil was privatized. Instead of increasing the portion of rent captured by the owners, governments in Canada have generally lowered tax and royalty rates to some of the lowest levels in the world.

Canada's political and economic elite has chosen not to develop an independent national energy policy or strategy; instead affirming Canada's position as a dependent supplier to the United States. The top priority since at least the early 1970s has been to maximize exports of oil and gas to the United States. This policy has been strongly advanced by the owners of the oil and gas industry in Canada. It has been entrenched in the Canada-US Free trade Agreement (1988) and the North American Free Trade Agreement (1994). Under the provisions of these two treaties, our governments have agreed to a continental energy program that gives the United States guaranteed access to Canada's oil and gas. We cannot cut our exports to the United States below the average share of production over the past three years. Has this policy been in the best interest of Canadians?

Saskatchewan has had the good fortune of sitting on top of Canada's second largest source of oil and gas. The industry was developed here by private corporations with very strong support from the provincial government. Since oil and gas are natural resources, under the Canadian constitution they are the jurisdiction of the provincial governments. In Canada, as in almost all countries, natural resources are considered a free gift from nature and thus are under the ownership of the people as a whole. When they are extracted by private corporations for the purposes of making a profit for shareholders, there is the question of what royalties and taxes should be paid to the general public. In Canada and Saskatchewan, the historic tradition has been to set very low royalties in order to encourage private development. In general, state or public development has been ruled out.

With the rise of international oil prices in the 1970s, the question of who benefits from natural resource exploitation became a major political issue. Following the price rises of 1973, public opinion polls showed a majority of Canadians wanted to see the oil and gas industry nationalized. In Alberta and Saskatchewan the provincial governments moved to take greater control over the industry and other natural resource developments.

In Saskatchewan the NDP government of Allan Blakeney (1971-82) raised the royalties and taxes on the oil and gas industry and created SaskOil, a Crown corporation, which was expected to gain some control over the industry. The Saskatchewan Heritage Fund was created to receive a share of natural resource royalties and use this capital to expand other industries. The development of natural gas in the province was under the control of SaskPower, which directly developed natural gas deposits. SaskPower had first claim on all natural gas extracted in the province. The policy goal was to guarantee a secure supply for the future needs of the people of Saskatchewan before any gas could be exported to Eastern Canada or the United States. This policy of provincial development was rejected by the governments that assumed office after 1982. The Progressive Conservative government of Grant Devine (1982-91) and the subsequent NDP governments headed by Roy Romanow and Lorne Calvert have steadily reduced the royalties and taxes on the industry. SaskOil was privatized. The Heritage Fund was abolished. SaskPower was split, and Sask Energy was created to have jurisdiction over natural gas. However, the natural gas industry was privatized and made part of a continental regime. No longer does the province try to maintain a supply for future generations.

Where has this left us? Saskatchewan's conventional oil and gas reserves are being rapidly depleted, and shipped off to the United States. We have only an eight year supply of natural gas at current rates of extraction. In 2004 the premiers from the four western provinces endorsed the call from George W. Bush for a new continental energy pact that would further tie Canadian production to US markets. In February 2006 Premier Lorne Calvert and Industry and Resources Minister Eric Cline went to Washington to meet with Vice President Dick Cheney, to make it clear to him that the government of Saskatchewan is fully behind exporting even more energy, if that is possible. There has been no public debate on this government strategy, most likely because it is strongly supported by the two opposition parties, the Saskatchewan Party and the Liberal Party. However, there is growing evidence that a large proportion of the people in Saskatchewan do not agree with this strategy.

The other key issue for Saskatchewan is the question of greenhouse gas emissions and global warming and climate change. The general conclusion of the many studies of the effects of global warming and climate change is that the Canadian prairies, and in particular Saskatchewan, will be very hard hit. Yet the political and economic leadership in Saskatchewan does not seem to be worried. In 1997 the legislature unanimously passed a resolution denouncing the Kyoto Protocol on Climate Change and vowed that no government

would impose mandatory regulations on greenhouse gas emissions. Since then Saskatchewan's greenhouse gas emissions have increased faster than any other province. In 2006 they are 62 percent above 1990 levels. Under Canada's international commitments under the Kyoto Protocol, we are to reduce emissions to six percent less than the rate in 1990 by the year 2012. There has been no effort by the NDP government in Saskatchewan to deal with this issue. While Saskatchewan has an enormous potential for alternative sources of energy including wind, solar, biomass, geothermal, and hydro, there has been very little development of these resources. The government has not been willing to implement any energy conservation or demand management programs.

The oil and gas industry in Saskatchewan cannot be assessed outside the development of the industry as a whole, the international situation, and our relationship with the United States. To propose a policy for the province requires a firm understanding of the world situation. Thus the paper includes an overview of the geopolitics of the industry, the growing debate about peak oil and natural gas, and environmental concerns. It also addresses what is meant by economic rent from resource extraction (excess profits) and explores global trends in rent and tax measures. As this is the most important aspect of any debate on energy policy, a significant portion of the paper addresses this background. This includes a number of examples of the fiscal regimes used by other governments to recover economic rents, including public ownership.

Saskatchewan's policy also is greatly affected by Canada's policy and the continental integration of the industry. Thus, this paper also addresses the national and North American context of oil and gas.

The section on the oil and gas industry in Saskatchewan includes an assessment of the extent of the resources, the nature of the oil and gas industry in the province, an attempt to discover the profitability of the industry, and the changes to the system of royalties and taxes. The conclusion is that there is a need to return to the policy direction started by the government headed by Allan Blakeney. What we need today is a policy direction that puts the general interests of the population as a whole, and the needs of future generations, above the present policy direction, which puts the first priority on maximizing profits for the owners of private oil and gas corporations and the national security needs and consumption demands of the United States.

1. The Oil Industry: Historical Background

Oil is a special natural resource, different in many ways from the others. The extraction of oil and natural gas has been much cheaper than other mineral resources. The process has also required less labour compared to mining. Historically, petroleum extraction has been a very profitable industry, and oil corporations are among the richest around the world. Oil is the most widely used and prized energy source because of its central role in transportation. Natural gas, coal, and nuclear power can be used as substitutes in many industrial and commercial operations, but it would be very hard to find another fuel to easily use in transportation. Oil has another decisive advantage: it can be rather easily transported by pipeline and tanker. World War I demonstrated for all the key role of oil in the ability to wage modern warfare. Since then all countries have concluded that access to oil is a central factor in guaranteeing national security.

The oil and gas industry in Saskatchewan does not operate in a vacuum but it is intimately linked to broader historical developments. This includes the monopolistic domination of the industry by the "supermajors" as they are called today and the close links between the large oil corporations and all governments. Historically, there were close ties between the industry and colonialism and imperialism, a mutually beneficial relationship. Today there is a central conflict in the world between the industrialized capitalist countries and the less developed producing countries, the site of most of the world's remaining reserves. For Canada, the continental integration of the industry began with the earliest developments, and this intensified during the Cold War against communism. Under the current North American free trade agreements, the United States is guaranteed a significant proportion of Canada's oil production. These agreements greatly restrict the ability of Canada to establish a nation energy policy designed to guarantee energy security for future needs.

Oil and the emergence of transnational corporations

The oil industry first emerged in the United States in the late 19th century. It became a major industry after the development of the automobile in the early 20th century. Large deposits in Texas and Oklahoma gave the United States a tremendous advantage over the other European world powers. John D. Rockefeller's Standard Oil Corporation (now Exxon-Mobil) became a monopoly firm in the United States and the first truly American international corporation. Competition came when the US government broke up the monopoly using the Sherman Anti-Trust Act. From it's assets, Andrew Mellon created the Gulf Oil Corporation, other major capitalists created the Texas Corporation (Texaco), and several other oil corporations were created. However, Standard Oil remained the dominant integrated corporation, from oil extraction to refining and wholesale and retail distribution. They set the standards and prices for the industry, and the others followed.

On the international level there was some competition to Standard Oil. The Nobels and the Rothschilds developed the oil fields in Russia, and Dutch interests developed oil fields in their colony in the Netherlands East Indies. In 1907 British and Dutch capital joined forces to create the Royal Dutch Shell Group, now one of the two dominant British firms.

Oil was also key to the British economy. Just before World War I Winston Churchill, then First Lord of the Admiralty, converted the British fleet from coal to oil, which gave their ships the advantage of wider range as well as greater speed. However, the British did not have a domestic source of oil, and their imperial policy concentrated on gaining and keeping control of the oil economy of the Middle East, in particular that of the Persian Gulf area. To confront Standard Oil the British Parliament created the British Petroleum

Corporation (BP) out of the Anglo-Persian Oil Company, with the British government owning 51% of the stock. Other European countries followed suit, convinced that national security and uninterrupted access to oil required a national state-owned company. World War II again demonstrated the importance of control over oil, as Japan sought to gain control of the Dutch East Indies and German armies marched into the Soviet Union and North Africa partly to try to secure access to oil supplies.

The international oil cartel was formally established by Standard Oil, BP and Shell in Scotland in 1928; it soon expanded to include Gulf, Texaco, Mobil and Standard Oil of California. The infamous Seven Sisters worked together to try to control oil production and pricing. Throughout North Africa, the Middle East, Venezuela, and indeed around the world, they have worked together in numerous joint ventures. (See Engdahl, 2004; Engler, 1961; Tanzer, 1980; Yergin, 1991)

Oil corporations and government policy

By the end of World War II it became very evident to the US government that domestic supplies of oil were limited and the future depended on secure oil sources in Venezuela and the Middle East. In the post-war period down to 1953, the US government contested with the British for control over Persian Gulf oil. Each government relied on their close relationship with their major oil corporations. The US government dominated the huge resources in Saudi Arabia through the Arabian American Oil Company (ARAMCO), controlled by US corporations, and a political alliance with the Saudi royal family. The British government and its two corporations, BP and Shell, were dominant in Iran, Iraq and some of the small Persian Gulf principalities. In 1953 the US and UK governments engineered the overthrow of the democratically elected government of Mohammed Mossadegh in Iran and established a puppet regime. The five US majors were given a key position in the Iranian oil industry. After the failure of the British-French-Israeli invasion of the Suez Canal in 1956, the British government was reduced to acting in concert with the US government on Middle East issues as a junior partner. BP and Shell joined with the US majors to try to establish control over oil production and pricing.

The complete domination of the oil industry by the governments of the United States and Great Britain and their monopoly corporations ended with the formation of the Organization of Petroleum Exporting Countries (OPEC) in 1960. The goal of the founders of OPEC was to create an organization that could manage the production of oil and influence the international price. Their model was the Texas Railroad Commission, used in the 1930s to prorate the production and sale of oil in order to raise prices and prevent market competition. These producing countries, now independent from colonial rule, had all suffered from a long history of colonial and imperial domination from both the European governments and the foreign-owned oil corporations. Over the 1960s and into the 1970s OPEC aided their member governments in negotiations with the majors. They created state-owned National Oil Companies (NOCs) and replaced the exploitative concession agreements with new production sharing agreements and higher royalties and taxes. Their goal was to capture a much higher share of the economic rent (excess profits) from the depletion of their natural resource for their governments. (See Yergin, 1991)

As many economists have argued, the oil industry has never been an example of free market capitalism. The large corporations used monopoly power and international cartels to keep prices and profits high. The US government wanted prices to remain high enough to protect their domestic industry. For example, in 1955 it cost $0.10 to extract a barrel of oil in Kuwait that sold for $1.85 in the United States. Where the average US oil well produced 15 barrels of oil per day, the average well in the Middle East produced around 5,000 barrels. In 1955 the 175 producing wells in Kuwait produced the equivalent of one-sixth of the average daily yield of the 500,000 wells in the United States. (Engler, 1961)

The ability of OPEC to control production and raise international prices was demonstrated in 1973, the Afirst oil crisis." When the US government backed Israel in the Arab-Israeli conflict, the Arab states cut off oil exports to the United States and Europe, creating a panic situation in North America. The Asecond oil crisis" came in 1979 when a popular revolution overthrew the US puppet, the Shah of Iran, and a new Islamic government was installed. The political conflict resulted in a dramatic decline in oil exports. The National Iranian Oil Company would now control all domestic oil production. At this time President Jimmy

Carter proclaimed the "Carter Doctrine", stating that the Middle East was a "vital interest" of the United States and the US government would use military force to prevent any obstruction to the flow of oil to the industrialized western countries. This doctrine, supported by all subsequent US presidents, formed the basis for the Gulf wars of 1991 and 2003. (See Blair, 1976; Endgahl, 2004; Klare, 2002; Paul, 2003; Tanzer, 1980; Yergin, 1991)

II. The Geopolitics of Oil

The current world oil and gas situation is complex, but over the years there have been major shifts that reflect the changing system of world power. From the beginning down to the mid-1970s, the industry was dominated by the vertically integrated major oil corporations, known in the industry as the independent oil companies (or IOCs). They were powerful because they controlled the oil business from discovery and extraction through refining to retail distribution. They were a formal and informal cartel, working together and not against each other. The large oil corporations also worked closely with governments.

This situation began to change following the independence of the former colonies and the emergence of governments pursuing national development programs. From around 1970 to 1980 OPEC was strengthened and almost all of the former colonies created state-owned oil and gas corporations (known as national oil companies or NOCs). The OPEC countries managed to capture a much higher percentage of the economic rent from oil extraction. However, the private corporations continued to make substantial profits through their vertical control of the downstream industry. Prices were largely held in a moderate band, controlled by the close relationship between the US government and the Saudi royal family.

The world recession in the early 1980s and the debt problems of the less developed countries brought major changes. Between 1980 and 2000 the oil majors, backed by their governments and international finance and trade organizations, took the offensive. The Third World debt crisis was used by western governments and the international institutions they controlled to push hard for the privatization of the NOCs and the liberalization of access to oil in the producing countries.

However, since around 2000 there has been another shift in policy direction. There is a revival of the status and power of the NOCs, and governments are once again moving to obtain higher royalties and taxes from the extraction of their oil. Many of the NOCs, both large and small, are now bidding for exploration and development contracts on a world wide basis. The increase in oil and gas consumption by China and India has also changed the international market substantially. The advanced industrialized countries are not the only market for oil exports, and competition is increasing. China and India, through their national oil companies, are seeking access to energy sources world wide. Large Russian companies, both government-owned and private, have been moving into the world market. Rising world oil prices after 2000 have led to greater debate on the question of peak oil production. The US/UK war on Iraq has disrupted the oil market and resulted in a new alliance of interest between China and Russia.

Within this general world situation there is the key role played by the United States, the dominant world political, military and economic power. US national security policy on energy has stressed several key objectives. The most important is continued control of oil in the Middle East, with the central focus on maintaining the partnership with the Saudi royal family. Saddam Hussein's regime in Iraq had been a key US client state until their invasion of Kuwait in 1991. Following the first Gulf War, the Hussein regime moved to shift development to Russian, Chinese and Japanese oil corporations and exclude those from Great Britain and the United States. This was certainly one of the key reasons for the 2003 US/UK war against Iraq. This war was strongly supported by the US/UK oil corporations.

A second objective of US policy has been to control access to oil from Venezuela, accomplished over the years by indirect political intervention in that country. This began to change after the election of Hugo Chavez in 1998. Panic began to set in when the new government raised royalties and taxes and insisted on majority equity positions in oil developments. However, Venezuela continues to ship oil to the United States and participate in joint

ventures with the major IOCs.

The third objective has been to maintain control over oil and gas production in Canada and Mexico. Oil and gas from Canada and Mexico is seen as domestic supply and never treated as foreign. In this they have had the allegiance of the oil industry and all Canadian governments.

The fourth, and newest objective of US policy is to gain and maintain access to oil reserves around the Caspian Sea, one of the few large remaining conventional oil pools. This was a focus of the National Energy Policy Development Group headed by Vice President Dick Cheney, which reported in May 2001. The war against Afghanistan has been seen as part of this policy objective. (Clark, 2005; Engdahl, 2004; Klare, 2002; Shelley, 2005)

Globalization and the international response

The oil majors and the governments of the industrialized capitalist countries were not at all happy with the changes of the 1970s: national oil companies, local control over ownership and development, and increased royalties and taxes. The UK government under Margaret Thatcher and the US government under Ronald Reagan led the push for an international free market. The industrialized countries, which depended on importing oil and gas, formed the International Energy Agency (IEA) to combat OPEC and the Third World drive for national control over resource development. They used the International Monetary Fund (IMF), the World Bank (WB) and the US Agency for International Development (USAID). Structural adjustment programs (SAPs) which were forced on Third World countries, required deregulation, privatization and the end to limits on foreign investment and control. They were supported by the Organization for Economic Co-operation and Development (OECD), regional development banks and institutions, the newly formed World Trade Organization (WTO), and the international free trade treaties, like NAFTA. This was part of the shift in the world economy to "globalization" or neoliberalism, the reduction of the role of the state in the economy and the liberation of private capital for world wide investment. (Engdahl, 2004; Klare, 2002; Shelley, 2005)

The model advanced by the US/UK governments and the majors was the British policy towards North Sea oil and gas. Development was to be undertaken by the private oil corporations. There would be little government regulation. Royalties and taxes would be minimal. The IOCs would be allowed to extract and export oil and gas as fast as they wanted, without government restrictions. The majors did not hesitate, but by 1999 the extraction of both oil and gas had peaked in the North Sea and Great Britain once again became an energy importing country. In contrast to these trends, a number of countries chose a different path. Norway, for example using Statoil, higher royalties and a range of taxes and government regulations, adopted a different policy for oil and gas extraction in the North Sea. (Darley, 2004; Mommer, 2002a)

The US government pushed hard for deregulation and privatization of the oil and gas industry in Latin America, aided by strong support from the IMF and the World Bank. There was a shift in policy towards liberalization in the smaller countries and even Venezuela, which had launched OPEC. The greatest achievement was in Argentina, where the government of Carlos Menem, the poster boy of the free market and free trade advocates, sold the state-owned oil company, Yacimientos Petroliferos Fiscales (YPF) to the now privatized Spanish firm, Repsol. (Mommer, 2002b; Palacios, 2002)

The process of privatization of the national oil and gas industries is described by Luisa Palacios. First, "reform" in the upstream sector begins with the opening of service contracts to foreign companies. Second is the introduction of "risk service contracts" that enable private corporations to receive a share of the profits or oil extracted. Third, there is the introduction of production sharing agreements (PSAs) with private and foreign oil corporations. Fourth, there is the re-establishment of concession contracts, where the private firm, domestic or foreign, owns the total production. The NOC no longer has a monopoly over local development but must compete with the large IOCs. Finally, there is the partial and then total privatization of the NOC. In Brazil the government allowed investors to buy a large minority share of the stock in Petrobras. However, in Latin America only Argentina completely privatized the state-owned industry. To a large degree this is the process we saw in Canada with the repeal of the National Energy Program (NEP) and the privatization of Petro-Canada. (Palacios, 2002)

A new environment begins in 2000

After the collapse of the Soviet system in 1989 and the move by the Chinese government to embrace the capitalist system, the division in the world political economy was often seen only as one between the owners of land and resources (the proprietors) and the consumers. This was particularly true of the oil and gas industry. The proprietors, who may be individuals or the state, wish to maximize their return for the depletion of the resource through royalties and taxes and perhaps state ownership. The consumers use the state and private corporations to secure relatively free access to natural resources. The proprietors might wish to slowly develop their resources to manage them for the benefit of society as a whole. In contrast, the private corporations and their government supporters seek to accelerate extraction on a shorter term basis. In general, proprietors wish to obtain immediate payments for the resource depletion in the form of royalties; in contrast, the private corporations argue that they should only be taxed on their profits. (Mommer, 2002b)

However, there has been a significant change in the geopolitics of the oil and gas industry beginning around 2000. First, China became a large importer of oil, up to 2.6 million barrels per day in late 2005. Strong economic growth has also led to significantly greater imports for India; almost 2 million barrels per day. Continued steady world economic growth has increased oil and gas consumption in general. Projections are for world demand for oil to increase by around 2.4 percent per year between 2005 and 2015. (Energy Intelligence Group, August 2005)

In Russia the oil industry was privatized following the collapse of the Soviet system, under the government headed by Boris Yeltsin. However, the current president, Vladimir Putin, has concluded that the Russian state must have a major interest in the industry. Gazprom, which is majority owned by the state, has a dominant and growing role in the natural gas industry. OAO Rosneft, the state-owned oil company, took a major ownership position in the largest Russian oil company, OAO Yukos. In 2002 the government raised royalties and taxes on oil and gas. Regulations now virtually exclude the foreign owned IOCs from operating in Russia. (US Energy Information Administration, June 2005)

In Venezuela, Hugo Chavez's government has reasserted its control over the oil industry and PVDSA, the state-owned oil company. Concession agreements with IOCs were transformed into production sharing agreements, and royalties and taxes were increased. However, in addition Chavez is building links with all the Caribbean and Latin American countries and entering into agreements with many local NOCs. The Venezuelan government has given support to expanded state ownership in Bolivia and Ecuador and has helped the government of Argentina re-establish a state-owned oil firm. Chavez's government helped launch Petroamerica, a conglomerate composed of all the major Latin American oil and gas producing companies. The long term goal is to exclude US oil and gas companies from Latin America and build a system linking less developed countries. (US Energy Information Administration, June 2005)

The world geopolitical situation also has changed significantly since the terrorist attack on New York City and Washington in September 2001 and the US/UK invasions of Afghanistan and Iraq. In the brutally frank national security policy statement of September 17, 2002, the US government proclaimed its position as the world's dominant power and warned others, specifically the European Union and China, not to try to challenge the United States for supremacy. The search for oil security has been seen as the dominant motive for US policy in the Middle East and the Persian Gulf area for many years. As mentioned earlier, this includes the intervention in Afghanistan. (Clark, 2005; Johnson, 2004; Klare, 2002; Shelley, 2005; National Security Strategy of the USA at www.whitehouse.gov/nsc/nss)

The US proclamation shocked the world and led to some notable geopolitical developments. In December 2004 the Association of South East Asian Nations (ASEAN) plus China, Japan and South Korea met to begin creating a new East Asian Community similar to the European Union, and excluding the United States. In April 2005 the governments of China and India signed a new "strategic partnership" designed to end long term disputes.

In October 2004 Vladimir Putin visited China and signed agreements on military co-operation and the sharing of energy resources. New pipelines will be built, and Russia will increase oil and gas exports to China. Furthermore, Russia and China created the Shanghai Co-operation Organization (SCO) with Uzbekistan, Tajikistan, Kazakhstan and Kyrgyzstan. This new organization asked the US

government to remove its military bases from Uzbekistan. Their goal is to exclude the United States from direct access to Caspian Sea oil and gas. China and Russia have also formed a political alliance with Iran, a major exporter of oil to China; this runs counter to the policy goals of the US and UK governments. The strength of SCO was evident at their fifth summit in June 2006, where Iran and Pakistan officially requested membership and the government of Afghanistan sought closer ties despite its complete political dependence on the US government and its NATO allies. (Engdahl, 2006; Ismi, 2005)

The period of expanding globalization has ended. With this, there has been significant structural change in the oil and gas industry. There is a general decline in non-OPEC oil production as reserves are disappearing. Increased world demand, the shortage of refinery capacity, the loss of much of Iraq's oil, and the shrinking of the "excess capacity" of the OPEC countries were all major factors contributing to the oil price increases between 2004 and 2006.

A major problem has been the inability of the IOCs to add sufficiently to their reserves. The large NOCs and their supporting countries have generally restricted access by the private foreign-owned oil companies to their national reserves. The NOCs, now actively operating on a world wide basis, are providing stiff overseas competition to the IOCs. There is also growing evidence that the NOCs and their government supporters prefer to sign agreements among themselves, excluding the IOCs.

The expansion abroad of the Chinese NOCs, supported by their government, is providing serious competition for the IOCs. In the Middle East they now present an important alternative market to the United States and Europe. At a conference in Vienna in 2004, Vahan Zanoyan, President of PFC Energy, a highly respected oil and gas consulting firm, told the majors that they would have to give up their "invader attitude" when dealing with less developed countries. In contrast, the Chinese government stresses mutual trust and mutual benefit and the need for less developed countries to work together. The Chinese NOCs usually combine more favourable oil and gas agreements with direct Chinese government assistance for infrastructure and social programs. (Cook, 2004; Engdahl, 2006; Ismi, 2005)

One of the major areas of conflict today is between the private oil and gas industry and the state-owned industry. For the most part they reflect the conflict between the advanced capitalist states, the major consuming countries, and the less developed countries: those who have the preponderance of the remaining proved oil and gas reserves. Given the prominent role of this conflict in the geopolitics of world oil, it is useful to look at this in more detail.

Independent oil companies

The major oil companies were the first truly transnational corporations, operating on a world wide basis in many countries and colonies. They were the first to fully develop the system of transfer pricing, where costs were shifted around within the company, between vertical divisions, and between operations in different countries. This system is now widely used by all major industries to minimize taxation. By underpricing and overpricing oil and gas, as well as other general and administrative costs, companies shift costs to high tax areas and maximize profits in low tax areas. Vertical integration gave the majors advantages. They were able to create barriers to entry into the market by smaller firms. They had the ability to act as an oligopoly, managing the system and prices through their market power. There was, of course, the formal cartel of 1928, which led to the domination of the Seven Sisters. In the colonies and semi-colonies where they extracted oil, the majors frequently formed joint venture operations. They worked together to confront political opposition based on nationalism and socialism. In these operations they had both the active and passive support of the home governments of the major powers. This stabilized the system to a large extent, but the oligopoly generally resulted in higher than necessary prices being extracted from consumers. As mentioned earlier, oligopolies are desired to keep prices higher than would have been the case in a relatively free market situation in order to expand production in relatively high cost areas like the United States, Canada, and the North Sea. (Drodas, 2003)

While today they are heavily in the business of extraction of oil and gas, the majors continue to make profits in the international market as the dominant sellers of oil and gas products. The takeover of smaller firms has always characterized the oil and gas industry, but in recent years we have seen the merger of many of the large corporations. The top 20 IOCs in 1997 had consolidated to only

seven by the end of 2003. The largest in 2004 by revenues were as follows:

Independent Oil Companies by Revenues
US$ (billion) in 2004

Royal Dutch/Shell	(UK/Netherlands)	$337.522
ExxonMobil	(United States)	298.035
BP PLC	(United Kingdom)	285.059
Chevron	(United States)	155.300
TotalFinaElf	(France)	152.614
ConocoPhillips	(United States)	136.916
ENI	(Italy)	65.175
RWE Dea AG	(Germany)	52.410
Repsol YPF	(Spain)	51.852
Marathon Oil	(United States)	49.907
Lukoil	(Russia)	34.068
EnCana	(Canada)	12.433
Petro-Canada	(Canada)	11.045

SOURCE: *Oil and Gas Journal*, September 19, 2005.

NOTE: By total assets, ExxonMobil is the largest oil corporation at US$328 billion. EnCana and Petro-Canada are included for comparison purposes.

National oil companies

While the IOCs are for the most part the major sellers of petroleum products, the state-owned oil companies (NOCs) are the dominant oil producers around the world. This is not to suggest that the NOCs are not also in the business of selling petroleum products. The top twelve sellers in the world include six NOCs: PDVSA (Venezuela), Saudi Aramco, Petrobras (Brazil), Pemex (Mexico), NIOC (Iran) and Sinopec (China).

We generally associate state-owned oil companies with the OPEC countries. However, according to a recent study by PFC Energy of Washington, D.C. there are today 60 or more NOCs who control around 77 percent of the 1.1 trillion barrels of proven oil reserves. J. Robinson West, chairman of PFC Energy, argues that "the rule makers are now the national oil companies. They drive the business." They are not all giant corporations. Petronas (Malaysia) has exploration and production (E & P) projects in 35 countries. Petrobras (Brazil) and Statoil (Norway) have operations in dozens of countries. (*Washington Post*, August 3, 2005)

The first NOC was created by the government of Austria in 1908, and five others were created in Europe. Even BP at first had over 50% ownership by the UK government. In the 1930s NOCs were created in a number of Latin American states, including Mexico and Venezuela. The process of decolonialization in the 1960s and 1970s also led to the creation of many others.

There have been numerous reasons cited for creating NOCs. In many countries it was to counter or remove the foreign-owned transnational corporations. The socialist experience encouraged state ownership as a way of mobilizing economic rent for national development. Because of the fact that oil is a strategic natural resource, deemed essential for economic development, state ownership was seen as required in any system of planned development. In other countries energy was considered a natural monopoly; electricity and natural gas had already been developed as state-owned industries, and oil was seen to be similar. Social democrats supported the select nationalization of a few key industries, and the oil and gas industries were seen to be central, part of the "commanding heights" of the economy.

In many free market countries the creation of NOCs was seen as necessary to "gain a window on the industry." The IOC majors were very secretive, engaged in transfer pricing, and were widely believed to practice tax evasion. Regulation and the imposition of corporate income taxes were deemed inadequate policies for controlling large TNCs. In some of the large importing countries, NOCs were established to promote competition with the IOCs.

However, for most governments, NOCs were deemed essential for the capture of economic rent. There were high levels of economic rent (excess profits or monopoly profits) in the oil and gas industries, and governments wanted to capture these rents for national development. In almost every country underground mineral resources were the property of the state, acting on behalf of the public in general. Even in the United States, in parks and national reserve lands, the oil and gas are owned by the state. It seemed only fitting that the development of non-renewable natural resources should be for the benefit of the society as a whole, and the best way to do this was through state ownership of development. Furthermore, IOCs were required to put the interest of their investors first. Maximizing profits almost always meant rapid

depletion. State governments had other priorities, like guaranteeing a steady supply of energy for their citizens and future generations. (For a good summary see Stevens, 2004)

Today there are three basic types of NOCs. First, there are the large companies that are dominant in the oil exporting countries, most of which are in the less developed world. This would include the large NOCs in the oil and gas industries in Russia. These countries now control around 80 percent of the oil reserves and 70 percent of the gas reserves. Second, there are the major NOCs in the large oil importing countries. These include the three large NOCs in China and the Oil and Natural Gas Corporation in India. Third, there are the NOCs in the smaller countries, whether producing or consuming, as well as those former NOCs that now have only partial state ownership. (Kronman, 2004)

The NOCs are among the largest oil and gas corporations in the world. The four largest world oil producers are NOCs: Saudi Aramco, NIOC Iran, PEMEX and PDVSA. They extract and sell more than 19 million barrels per day or over 23 percent of the world's production. Many of the NOCs do not reveal their annual sales. By production, the largest NOCs are listed at right.

It has long been argued that state-owned oil corporations, particularly those in the less developed countries, have been inefficient, plagued by corruption and patronage, and lack the technology and expertise for sound development. Some of this, where it is a reality, has been due to the fact that NOCs invariably have different mandates than private corporations. However, where this has existed in the past it is certainly changing, even in Mexico, often cited as the worst example of patronage and inefficiency.

However, even in poor underdeveloped countries, governments and national oil companies can do the job. They form joint ventures with private corporations and/or the large NOCs that operate on a global basis. They contract with or form partnerships with service companies, universities, and research institutes and organizations that have special expertise. Like all large corporations they engage in outsourcing. Tariq Shafiq describes the development of the state owned Iraq National Oil Company:

> "INOC had demonstrated a high degree of success and established an historical record of achievements. As it became operational, it entered into service agreements with France's Total AS and others in the early 1970s, then began oil exploration and development on its own and with the aid of oil service companies. It maintained the high exploration successes of its predecessor IPC and achieved speedy development work, multiplying the country's reserves, accelerating building production capacity, and expanding oil markets." (Shafiq, 2005:20)

National Oil Companies Oil Production
Million barrels, 2004

Saudi Aramco	(Saudi Arabia)	3,248.5
National Iranian Oil Co	(Iran)	1,435.2
PEMEX	(Mexico)	1,396.0
PDVSA	(Venezuela)	1,127.9
Kuwait Petroleum Corp.	(Kuwait)	855.9
Nigerian National Petroleum Corp.	(Nigeria)	855.2
PetroChina	(China)	778.4
Iraq National Oil Co.	(Iraq)	731.1
Abu Dhabi National Oil Co.	(Abu Dhabi)	713.6
OAO Yukos	(Russia)	589.8
Petrobras	(Brazil)	583.5
National Oil Corp.	(Libya)	564.7
Sonatrach	(Algeria)	440.6
Sonangol	(Angola)	359.5
Qatar Petroleum Corp.	(Qatar)	268.9
Petronas	(Malaysia)	267.4
Statoil	(Norway)	265.0
Egyptian General Petroleum Corp.	(Egypt)	258.8
Oil & Natural Gas Corp.	(India)	202.4
Petro-Canada	(Canada)	101.1
EnCana	(Canada)	60.7

SOURCE: *Oil and Gas Journal*, September 19, 2005.

NOTE: Petro-Canada and EnCana are included for comparison only. They are independent companies.

III. Peak Oil and Environmental Concerns

The rise in oil and gas prices since 2000 has once again raised the issue of the state of proven reserves. Everyone recognizes that oil and gas are finite resources that will be depleted. In 1956 US geophysicist Dr. M. King Hubbert predicted that US oil production would peak in 1970; he was denounced by the mainstream scientists and economists. However, US production peaked in 1970 and since 1973 has plateaued despite a steadily increasing number of wells drilled. US natural gas production peaked in 1973 despite the steady increase in wells drilled and new discoveries in the Gulf of Mexico. A number of recent studies have predicted that world oil production will peak sometime between 2005 and 2020. (See Darley, 2004; Deffeyes, 2001; Heinberg, 2004, 2004; Klare, 2005; www.peakoil.net; www.hubbertpeak.com)

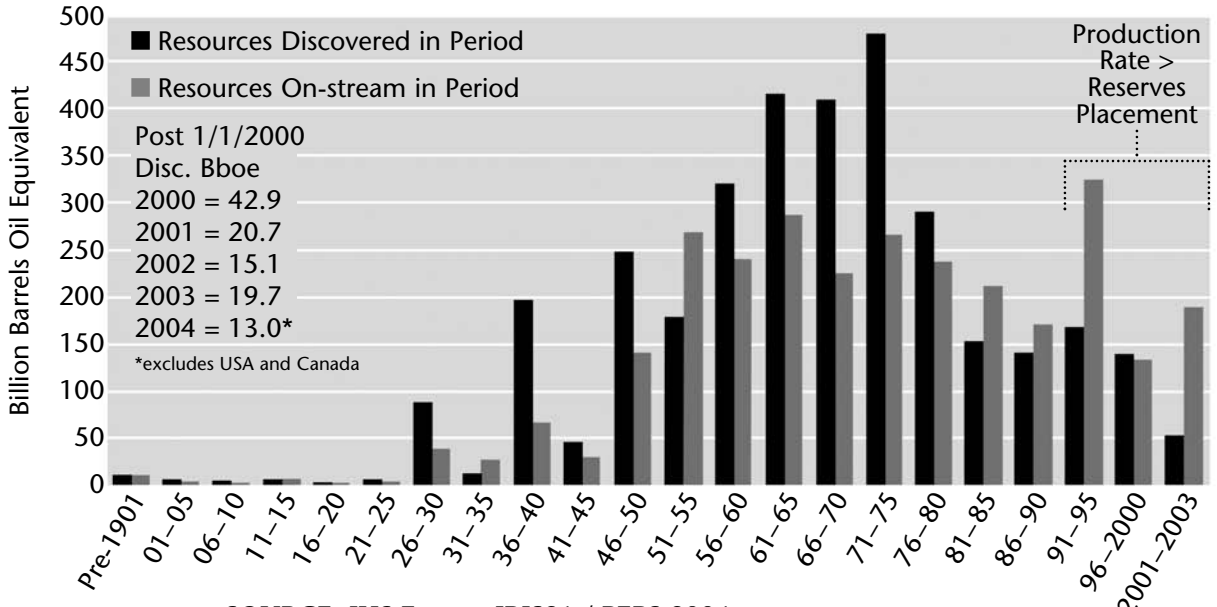
There are many influential voices on the other side of the issue, denying that peak oil will occur any time in the near future. These include the US Geological Survey, the US Department of Energy, the Cambridge Energy Research Association, the International Energy Association, OPEC and the major oil corporations. They are joined by the mainstream liberal economists like M.A. Adelman (1993) and H. J. Barnett and C. Morse (1963) who argue that if the free market works as it should, higher prices will encourage the development of new technologies and the more difficult sources of oil will be accessed. As Adelman notes today, 50 years ago offshore crude was a non-conventional source, but it is now the major new source of extraction. Furthermore, economists argue that as oil prices rise consumers will undertake conservation measures and shift to other energy sources. (Adelman, 2003; Farzin, 2001; Fletcher, 2005; Franssen, 2005; Takin, 2005)

Cambridge Energy Research Associates has argued that we should not be thinking about "Peak Oil" but instead an "undulating plateau" where supply and prices stabilize within a range, and that even this is two to four decades away. Advocates of Peak Oil have not adequately taken into account that 80 percent of the IOCs reserves are outside the United States and very difficult to assess, technology has made major advances, reducing the cost of extracting oil and gas from non-traditional sources, and new drilling has significantly expanded the capacities of older reserves. The oil capacity of the Middle East has been underestimated and under explored. (Esser, 2005; Yergin, 2006)

Nevertheless, there are good indications that we are moving closer to peak oil and gas, at least for conventional sources. The non-conventional resources that are coming on stream are more difficult and more costly to extract and are more environmentally damaging. This indicates that the era of cheap oil and gas may well be over.

This point has been made by IHS Energy, the most prestigious independent oil research organization in the world. Based in Geneva, IHS Energy has the most extensive data base in the world, and is used by most private corporations and government agencies. Their data indicates that the volume of discoveries on a world wide basis peaked during the period between 1961 and 1975. In a presentation to an international petroleum conference in Cairo in May 2005, IHS Energy showed that beginning in the 1981-5 period, the rate of oil production (or extraction) has been greater than reserve replacement, i.e. resources discovered. The gap has been highest in the 2001-3 period (see table next page):

Total Resources Discovered versus Resources Put On-stream

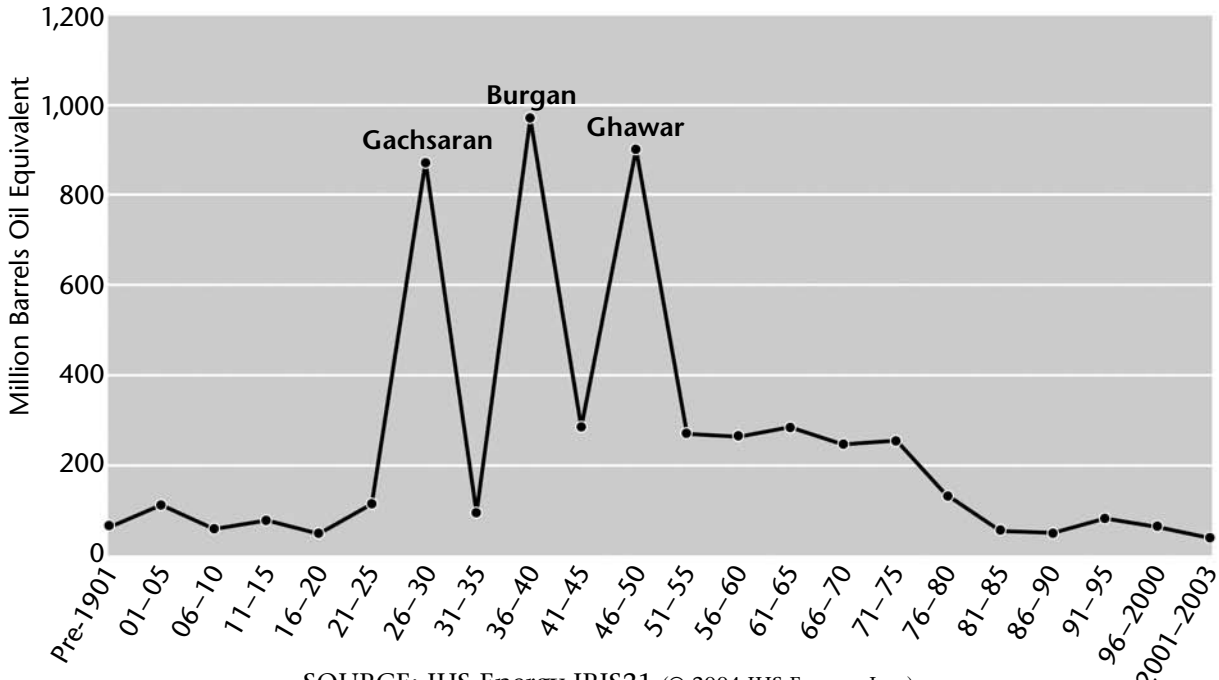


SOURCE: IHS Energy IRIS21 / PEPS 2004 (© 2004 IHS Energy, Inc.)

It has been widely reported that the average size of new oil discoveries has been steadily falling. This is also reported by IHS Energy. They show that in the 1951-6 period the average size of new oil finds was around 300 million barrels of oil equivalent. Since 1971-5 the size of new oil finds has steadily fallen to only around 40 million barrels of oil equivalent in the period 2001-3:

Average International Discovery Size

Average Size of All Discoveries by Five-year Period



SOURCE: IHS Energy IRIS21 (© 2004 IHS Energy, Inc.)

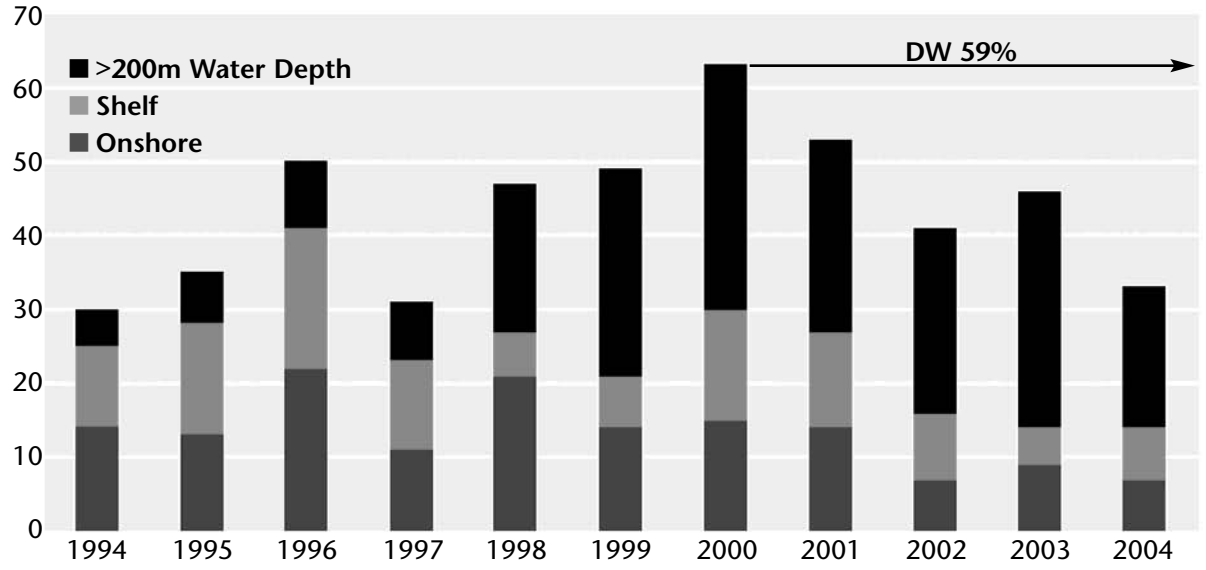
Many in the industry argue that the large oil fields on land (conventional oil sources) have been discovered. The oil industry must now focus on offshore and unconventional sources, which are more difficult to access, farther from markets and require greater capital investment. This is reflected in the data provided by IHS Energy; since 2000 the bulk of new discoveries have been in water deeper than 200 metres, while the oil reserves found on land and on the continental shelves have been declining:

The looming crisis: climate change

There is one other major issue that is almost completely ignored in all the industry and academic discussion about the future of oil and gas. The elephant in the room is greenhouse gas emissions and climate change. There is a mountain of evidence demonstrating that climate change is a reality, and this is becoming more noticeable to the general public every day.

Major Discoveries Setting – 1994 to 2004

Annual Number of 100 mmboe+ Discoveries from 1994 to 2003, by Physiographic Situation



SOURCE: IHS Energy IRIS21 / PEPS 2004 (© 2004 IHS Energy, Inc.)

A major concern expressed by industry analysts is the decline in expenditures on searching for new oil sources. For some time now the annual number of exploratory wells (called "wildcats" by the industry) has been falling steadily. Furthermore, on a world wide basis, both 2D and 3D seismic activity peaked in 2000 and has since been declining. The company that leads the industry in new discoveries is Brazil's Petrobras, which has specialized in offshore development. A study by Wood Mackenzie concludes that only 25 percent of the larger oil companies are fully replacing production through new field exploration. With prices high, most companies are expanding their drilling in producing fields to maximize cash returns. Across the companies surveyed, Wood Mackenzie reports that reserve replacement has fallen to 50-60 percent of production. (Stark, 2005; Latham, 2005)

As of the date of writing, a draft report from the National Round Table on the Environment and the Economy has been leaked to the press. Their report concludes that Canada faces a crisis "perhaps unmatched in times of peace." There will be damage to forestry, fishing and agriculture as a result of higher temperatures and uneven precipitation. The damage from climate change is already well known in Canada's north and will be particularly devastating to the Canadian prairies. The report concludes that the impact of climate change will touch on the foundations of Canadians' way of life - jobs, economic competitiveness, human health and cultural values. Yet as oil and gas prices rise the industry and political focus is almost exclusively on how to increase production to meet growing demand. Environmental issues, including climate change, are pushed aside. (Calami, 2005)

In November 2005 the International Energy Agency (IEA) released its annual report, *World Energy Outlook 2005*. The focus was on the question of peak oil and the petroleum supply available in the Middle East and North Africa (MENA). This is one of the few major studies that includes an examination of the greenhouse gas effects of increased extraction and consumption of oil and natural gas.

The IEA sets forth three scenarios. First, there is adequate oil and gas in MENA to meet rising global demand for the next quarter century and beyond. However, the problem in recent years has been a lack of investment in both the upstream and downstream industries. Just to maintain the present system to 2030 requires an investment of $17 trillion. If the governments and corporations re-invest in new production, the IEA expects that energy demand will rise by 50 percent to 92 million barrels per day (MMb/d) in 2010 and 115 MMb/d by 2030. However, carbon dioxide emissions would rise by 52 percent. As they conclude, this would "call into question the long-term sustainability of the global energy system."

Things would be worse under their second scenario, which is called the Deferred Investment Scenario. A continued decline in investment in new projects would result in inadequate supplies and bring higher energy prices, slower world economic growth, and would "choke off energy demand in all regions." With less energy production and consumption, greenhouse gas emissions would not rise as fast, but at a high economic cost.

The third scenario, which the IEA supports, is the World Alternative Policy approach. This is the general plan approved by the G-8 energy consuming countries at the Gleneagles Summit in July 2005. These relatively modest proposals call for emphasis on energy efficiency, conservation and shifting away from fossil fuels. Increased energy demand would fall to only 1.2 percent per year. However, even under this proposal it is projected that greenhouse gas emissions would rise by 30 percent by 2030. (IEA, 2005)

It should be remembered that under the Kyoto Accord, those countries that signed on agreed to reduce their greenhouse gas emissions by 6 percent below the emission levels in 1990 by 2012. Yet the scientists with the Intergovernmental Panel on Climate Change insist that there has to be a 70 percent reduction in greenhouse gas emissions if we want to stabilize the carbon dioxide levels in the atmosphere and escape the worst impacts of climate change. In 2005 Saskatchewan's emissions were around 62 percent above their 1990 levels and steadily rising. There is obviously a fundamental conflict between the goal of increased energy production focusing on the oil and gas industries and the goal of limiting greenhouse gas emissions and the impact of climate change. It seems clear that the business as usual approach being followed in Canada, and especially in Saskatchewan, is helping to guarantee that we will have extreme climate change from greenhouse gas emissions. (Environment Canada, 2006)

IV. Economic Rent from Resource Extraction and Government Fiscal Regimes

Natural resources are a free gift from nature. In all human societies for thousands of years natural resources were considered to be common property available to all for equal use. As humans moved to horticultural societies, families were often granted usufruct or use rights to certain resources like land for farming or grazing animals or special fishing sites. However, these were never considered private property. These rights were granted by the society as a whole and could be withdrawn. Those who had usufruct rights could not sell them as if they were private property.

It was only with the rise of more advanced agriculture, and the development of class divided societies, that we see the introduction of private individual ownership of land and resources and the concept of rent in landlord-peasant societies. Private ownership of land and resources inevitably means that few will own the resources and the majority will not. Thus peasants, serfs, peons and other agricultural producers were forced to pay a "rent" to the landlord for access to land in order to grow crops to support their families. The rent was generally considered to be the surplus over and above what the family needed to subsist. However, in a class society this was determined by the owners of the land, supported by their governments and the military-police forces. Thus under the feudal system in Europe the serf and his family worked one half of their time on the lord's land; the rent took the form of labour time. In general this was transformed into 50 percent of the crop, seen as the equivalent of 50 percent of the family's labour time. With the introduction of the money economy, the serf, gradually becoming a peasant, could pay his rent by a cash payment equal to 50 percent of the crop produced. This system still exists today in farming communities.

The new capitalist system required the privatization of natural resources so that they could be bought and sold in a market. The European powers imposed this new system on the areas of the world that they colonized. For example, from the earliest invasion of Ireland, England demanded that the land of the Irish clans be transformed from common social property to private property of the clan Chief, to be passed on to his son by primogeniture. This was one of the fundamental aspects of European imperialism and colonialism in the 19th century: the world-wide transformation of common land into private property. Thus we see the First Nations of Western Canada, in the negotiations that established the numbered treaties, questioning how common property like land, given by the Creator to all, could be transformed into individual private property. (Warnock, 2004)

Economic rent under capitalism

The concept of rent that we use today has its roots in the ideological defence of private property in resources constructed by the earliest political economists. John Locke (1637-1704) first set forth the classic case that was the foundation for all others. Locke, defending England's seizure of land from the indigenous peoples of the Americas, insisted that any individual or business could seize land that was not being efficiently used to produce profits. In doing so they owed nothing to the population in general for this action. Adam Smith (1723-1790) accepted Locke's argument. Economic rent was defined as the economic surplus extracted from labour applied to land and other resources. The capital used in the extraction and production process was nothing more than dead or accumulated labour, called "stock" by Smith.

However, the most widely cited liberal definition of economic rent was set forth by David Ricardo (1772-1823). Economic rent is the surplus that is created by the use of natural resources *over and above* what is necessary to keep labour and capital on the land and producing products. It is most important to remember that these costs include a normal profit. Economic rent therefore is created when the exploitation of natural resources like oil and gas produce a return that is *over and above* the normal rate of return. Economic rent is a *monopoly profit* or an *excess profit.*

Under this liberal capitalist view of economic rent, Ricardo did not include the payment of compensation or a royalty to the general public for the privatization and use of natural resources that had previously been considered social or public property. (Arneil, 1996; Gunton and Richards, 1987; Heilbroner, 1961; Warnock, 2004)

Nevertheless, in some pre-capitalist societies forms of royalties had been established to compensate the community for the private utilization of public resources. In Greek societies the silver mines were socially owned, but individuals were allowed to work a mine provided they paid a royalty to the government, a combination of a cash payment and a share of the production. In pre-capitalist Spain and its colonies there was a royalty for private use of resources, the flat rate *quinta real,* 20 percent of the value of the product. The first royalties used in the Middle East in concession agreements for oil were 12.5 percent, or one-eighth of the value of the resource extracted. With the spread of democracy in the 19th century in Europe and elsewhere, elected governments began to demand the payment of royalties and taxes to compensate for the extraction and depletion of natural resources.

The oil and gas industry

Within the oil and gas industry today, economic rent is generally defined as the difference between the cost of exploration, field development and extraction and the market price. These costs include a normal rate of return on investment. In this industry there is a very large economic rent and an ongoing political struggle over what share of that excess profit should go to the corporation and what share should go to the government.

Economic rent is a concept and it is not easy to measure. Oil is a finite resource, and it is distributed unevenly across the planet. It is also a rare resource, and it is characterized by different qualities and uneven concentration. Kenneth Dam has argued that for oil and gas the economic rent is directly related to field size. Rents are high in large fields, like those in the Persian Gulf area; they will be lower where the fields are relatively small, as is the case in North America today, where oil and gas extraction has passed its peak and has reached the "mature stage." There is also the question of risk, both technical and political, which affects private investment. (Dam, 1976)

Rent is also difficult to measure because the oil industry has never operated in a free market; it has always been characterized by monopoly, oligopoly and government support. In most areas of the world access to oil and gas has either been limited by the existence of large powerful firms or government regulations that prescribe limited access.

The oil and gas corporations have been supported by governments that accept oligopoly and provide a wide range of economic assistance. For years the oil industry in the United States was supported by import quotas and a pro-rationing system that controlled production, both designed to prevent the free market from working and to maintain stable prices. Since the creation of OPEC the super majors and their supporters in government have worked closely with the Middle East countries to develop a market system where oil sells within a prescribed band of prices that guarantees a good revenue to both the producing governments and the corporations. This is a new type of oligopoly. Under this world wide system, the majors expect to accumulate most of the economic rent. Indeed, they have created a situation where investors feel entitled to make higher profits in the oil and gas industry than they would investing in other areas of the economy. (Mommer, 2002a; Noreng, 2002)

Fiscal systems for extracting economic rent

All governments wish to obtain at least some revenues from the extraction and use of renewable and non-renewable resources. These resources are commonly owned by the state, and governments have the responsibility for controlling their extraction and use. Thus it has been argued that governments have a moral responsibility to ensure that future generations benefit in some way from their depletion.

For countries moving out of an agriculture

economy (including Canada), natural resources or staple industries have been a way of diversifying the economy, creating jobs, and supporting the development of those industries that provide inputs and forward links to industries that process the raw materials. In many cases, including Saskatchewan, these resource extraction and industrial projects can bring development and employment to rural and remote communities.

The approach of governments to the collection of economic rent varies around the world and across time. The democratic theory of rent sees natural resources as a free gift from nature that should be owned by and benefit the population as a whole. Governments that follow this theory of rent would seek to maximize their share of the economic rent, or excess profits, over the life of any resource development project. All governments also want to have steady and predictable revenue so that they can plan for public expenditures. A government pursuing a democratic theory of rent would be expected to place a high priority on developing policies that guarantee that the economic rent is re-invested in the country, and especially in the local area or province. If this does not happen, resource development results in boom and bust communities. A socially responsible government also aims to have a large share of the benefits from resource development accrue to local indigenous populations.

This contrasts with the liberal theory of economic rent that was developed during the rise of the capitalist system and in particular during the period when western European countries expanded abroad, implementing policies of imperialism and colonialism. Liberal theory argues that individuals and corporations may seize natural resources that are "not being used" for their own use. They have a moral right to transform public property into private property. Furthermore, they do not owe anything to the general public for the seizure of this common property as long as they use it to make a profit. Once all of the "waste land" and resources are acquired as private property, then a legal system is created to defend the rights of private property ownership. The most complete defence of this liberal approach to economic rent was set forth by John Locke in his *Second Treatise on Government* (1690).

In more recent times, we can see this liberal policy in operation when the Soviet countries were transformed into capitalist countries after 1989. Natural resource assets, like oil and gas companies and reserves, were "sold" to a few private individuals at prices well below the value of their assets. The liberal approach today is vigorously pursued by private corporations and governments, demanding that natural resources be privatized and that those who then use these resources should pay as little as possible for their use. (Arneil, 1996; Bina, 1985)

The advantages of state ownership[1]

Economic rent is most easily captured when resource development is through state-owned enterprises. The success of these enterprises depends on the degree of democracy that exists in the province or country. In an advanced industrialized democracy, like Norway, a NOC like Statoil is a very successful and efficient company. Petrobras in Brazil has a similar reputation. In Saskatchewan state-owned public utilities have been very efficient and innovative and provide excellent services. For example, the Crown corporations that were created in the resource sector, including the Potash Corporation of Saskatchewan, the Saskatchewan Mining and Development Corporation and SaskOil, were all very well run and provided greater returns to the general population than they have since they were privatized. In sectors of the economy that are dominated by large foreign-owned corporations with monopoly power, local, democratically controlled, state enterprises offer a very good alternative. (For Saskatchewan, see Tables I and II)

Around 100 countries have had state-owned oil and gas companies at one time or another, and they have a wide variety of histories. Like private corporations such as Enron (see later for details), there are a few examples of bad management. For example, in Mexico it was normal for PEMEX, the NOC that has completely dominated the oil and gas industry, to be used as a patronage instrument by the Institutional Revolutionary Party (PRI). Furthermore, it was government policy to require PEMEX to pay 65 percent of their annual revenues

[1] Governments have an additional role to play in resource development. Resource extraction can be very destructive to the local environment, often involving the production of toxic wastes. Furthermore, those working in the industry can be exposed to harmful and life-shortening products. We know this only too well in Saskatchewan; uranium mining in the North has been devastating to the environment and workers. Fossil fuel extraction normally entails production of locally- and regionally-harmful air pollutants, as well as greenhouse gas emissions that cause global warming. Governments need to establish and enforce strong regulations to protect the environment, communities and workers. (Warnock, 2004)

to the federal government. Revenues from PEMEX provided 35 to 40 percent of the federal government's revenues and greatly contributed to providing foreign exchange. However, these two policies left PEMEX with inadequate retained earnings to develop new oil and gas resources.

In Argentina the Peronista governments required YPF, its local oil and gas NOC, to pay 68 percent of its annual revenues to the government, which left it with inadequate funds for expansion. Furthermore, both Mexico and Argentina dictated that their NOCs should heavily subsidize the retail price of oil products, which cut into their revenues. Why did this happen? In both these cases the general policy was determined by the rich and powerful who controlled the government. Revenues from the NOCs allowed government to avoid imposing taxes on private corporations, wealth or individuals with high incomes. (Laguna, 2004; Palacios, 2002)

It is also relatively easy to collect rent when resource development is through joint ventures between NOCs and private corporations. In these cases, because of direct financial and management participation in the operation, the costs and revenues are known to the government. Many governments in oil producing countries have utilized production sharing agreements; it is common practice that the government takes a share of the oil or gas that is produced. However, because the government does not have a direct equity position in the private firms, they do not really know the details of how the companies are operating. (Mommer, 2002b)

The advantages of having a National Oil Company and government control the industry was demonstrated during 2005 when there was a rapid increase in the price for oil and gas and windfall profits that bore no relationship to the cost of production. In the OPEC countries the governments and NOCs had term contracts with the foreign-owned IOCs. Under these term contracts they were able to raise their prices for contract holders to match the increase in world prices. Thus in OPEC as a whole prices increased from their 2004 levels by 40.9 percent for the first nine months of 2005, and the income to OPEC countries increased 46.4 percent over the same period. In contrast, in Canada and the United States, almost all of these windfall profits went to the private corporations. (*Petroleum Intelligence Weekly*, October 31, 2005)

In contrast it is much more difficult for governments to recover a large part of the economic rent when the natural resource is being developed exclusively by private corporations. It is most difficult to gain a major share of the rent when development is by large foreign-owned transnational corporations who operate on a world wide basis and are vertically integrated. As we will see, the secrecy of operations, transfer pricing, and the increasing use of offshore tax havens have posed a very serious problem for governments around the world.

Rent collection in a private enterprise economy

Within the privately-owned portions of the oil and gas industry today it is assumed that private corporations and governments each have a right to a share of the economic rent (or excess profit). It is argued in contemporary *liberal* economic rent theory the goal of a taxation policy for resource extraction should be "neutrality." A neutral taxation system reduces the amount of economic rent going to the investor, but the taxes collected by the government would not be high enough to discourage investors from the industry. It should always be remembered that economic rent is an excess profit and under a *democratic* rent theory should all go to the owners of the resource, the general public.

Economic rent from oil and gas developments will vary depending on the size of the resource deposit, its grade, its ease of extraction, its location, the state of the local infrastructure, and the distance from important markets. Saskatchewan currently offers investors many advantages associated with very low risk areas and countries: a tax and royalty regime that is very favourable to the industry, a government that strongly supports and subsidizes the industry, concession agreements that maximize the control by the private corporation, no government controls on the use of profits, a highly skilled and educated work force, and excellent technical expertise available from government and universities. Government environmental regulation is minimal. There is no requirement to share revenues with local municipalities or Aboriginal communities. The present social democratic government effectively manages the labour force, and strikes are few and far between.

The industry believes that the share of the rent taken by the government should be spread over the length of production, or the full cycle net cash flow, and frequently this is not the case. What is needed, the industry argues, is a system of "progressive taxation." Taxes should be low while projects are

being developed, increased when production is peaking and then reduced when a gas or oil field is "mature" and the rate of extraction is in decline. However, we should never forget, as Daniel Johnston points out, "the objectives of oil companies are to build equity and maximize wealth by producing oil and gas at the lowest possible cost and the highest possible margin." (Andrews-Speed, 2000; Bina, 1985; Johnston, 1994; Raja, 1999; Sarma and Naresh, 2001; Walde, 2003)

Different government fiscal regimes

The earliest systems of private exploitation of natural resources involved the state granting concessions to individual developers. The payment by the private developer to the state is often described under the general title of "royalties." For example, in the forest industry in Canada in the 19th century there was a flat fee per tree felled. At a later time there was a fixed fee per cubic metre of wood harvested. This type of return to the public on resource extraction has the advantage of being easy to calculate, but it must be adjusted for inflation. In the oil and gas industries today in Canada and elsewhere there are royalty instruments or fees which include the following:

(1) Application fees for the right to do prospecting.
(2) Signature bonus bids for exclusive right to explore a particular piece of land.
(3) Discovery bonus payment or lease for production.
(4) Royalty or production fees, usually a percentage of the volume extracted.[2]

These are all government permissions giving the legal right to explore, develop and produce gas and oil on a particular piece of land. They are normally given for a specified period of time and can be revoked if they are not utilized. In most places, including Saskatchewan, the government auctions off particular tracts of land, and they are granted exclusively to the highest bidder. As Derek Lund points out, this kind of royalty system is more popular with governments where there is a relatively open economy and where transfer pricing or income shifting within transnational corporations is widely practiced. Michael Cartwright notes that this type of payment system is preferred in the United States where land is owned by private individuals or companies. It is a way to bypass the "creative accounting" used by large corporations. (Cartwright, 1999; Lund, 2002)

Royalties are often imposed on the volume of the resource that is extracted, often a fixed percentage of the volume of production. A royalty can also be *ad valorem*, i.e. a percentage of the gross revenues from extraction. Royalties in whatever form are considered a cost of production, a cost of doing business, and are deductible from gross revenues for the purposes of taxation. In Canada and Australia, *ad valorem* royalties have different scales according to the time when the resource came into production – "old oil," which was less costly to develop, has a higher royalty than "new oil," which is found in smaller pools and at deeper levels.

In the present world oil industry there are limited areas where there are prospects for discovering and developing large pools of oil and gas. Competition for access to resources is keen. Increasingly, governments are demanding a percentage of the oil and gas produced. These are known as *production sharing agreements*. For example, Venezuela and Kazakstan are now demanding and receiving 50-50 sharing of oil between their NOCs and private corporations. Indonesia has a First Tranche Petroleum (FTP) system where all private developers must set aside for the state the first 20 percent of all oil extracted. These are also considered to be royalty systems, a necessary cost of production.

In some countries governments take equity positions in oil and gas development. These are known as *joint ventures*. This requires the government to invest in development projects. Not only must the government provide capital; it will also share the risk and the profits. Under the provisions of the Saskatchewan Mining and Development Act, the Crown corporation SMDC was allowed to claim up to 50 percent equity in all new private mining developments. This was exercised in a number of uranium developments, which proved to be very profitable for the government. (Kaiser and Pulsipher, 2004; Lund, 2002; Sarma and Naresh, 2001)

The industry as a whole does not like production royalties or bonuses. They are considered "regressive" in that they are a low risk to governments and result in a higher effective tax rate. The industry naturally prefers a system based solely on

[2] There are other mechanisms as well, including competitive bidding on royalties, and royalties that provide a fixed return to industry. See Annex – Fiscal Regimes.

taxing profits, which they call a "progressive" taxation system. Those fiscal regimes that have low royalties and bonus bids are considered by industry to be "neutral" fiscal regimes. Many in private industry point to the royalty-tax regime established by the UK government for the North Sea as close to the ideal system. (Kjemperud, 2004; Raja, 1999; Walde, 2003)

The industry would prefer a taxation system where the only obligation to the owners of the resource would be an income tax. In Canada it has been a long tradition to have a lower income tax for resource extraction than for corporations in general. In many countries there are different rates of income tax, with lower rates offered to small or local companies. Where there is a federal structure, oil and gas corporations will be expected to pay regional as well as national income taxes. A number of countries impose a minimum tax because tax avoidance is such a major problem with large corporations.

A number of countries have introduced a *progressive profits tax* (PPT): as the reported profits rise, so does the rate of taxation. This system is used in Canada, Australia and the United Kingdom. Canada also has had a minimal federal large corporations tax on capital that exceeds $10 million.

However, the taxable net income reported by oil and gas corporations is usually only a very small percentage of gross revenues. Why is this the case? First, there are normally very generous depreciation allowances given to resource extraction corporations. In Canada oil and gas corporations are allowed a 100 percent depreciation for capital purchases in the first year. Exploration and development costs can be amortized over a period from five to 15 years and deducted annually. It is the norm in the industry for governments to give a wide variety of tax incentives to companies, including tax holidays and investment tax credits, like those given for research and development. Business losses can be carried forward or backward, usually seven or eight years. Canada provides for a resource allowance and a processing allowance, which has been 25 percent of profits. (Copithorne, 1979; Lund, 2002; Noreng, 2002; Sarma and Naresh, 2001; Walde, 2003)

In recent years a few countries have introduced a form of *resource rent tax* (RRT). Most often it takes the form of a percentage tax on cash flow. The goal is to increase the tax take on resource development projects when the returns are very high, producing super profits well above the average rate for the industry. They are normally assessed on a particular project, as is the case in the Australian system. The advantage of this for corporations is that any negative cash flows that might occur at the beginning of a project can be accumulated and then deducted from positive cash flows. In Australia the tax is assessed only when the returns exceed a particular threshold, which in this case is 15 percentage points above the bond rate. (Australia, 2004; Sarma and Naresh, 2001)

There are other forms of taxation used to appropriate economic rent. In 2005 and 2006 a number of countries introduced some form of excess profits tax to try to capture some of the excess profits being created with the rapid rise of the international price of oil. Russia has imposed *export tariffs* and *excise taxes* after the privatization of the industry (1992-6). Along with royalties and income taxes, this regime allowed the companies to keep around 30 percent of the revenues with 70 percent going to the state. However, oil and gas policy has changed direction under the government of President Vladimir Putin. Not only has he moved to re-nationalize a significant part of the oil and gas industry, he has cracked down on tax evasion and increased the rate of royalties and taxes. In August 2004 export duties were raised; when the international price of oil rose above $25 per barrel, the export duty was designed to take 90 percent of the price increase. With the windfall oil profits in 2005, the government raised the export tax again, taking 90 percent of all export revenues above $27 per barrel. With the capture of a greater share of the economic rent, the Russian government was able to pay off $23.7 billion from the Soviet era owed to the Paris Club of creditor countries. (*Globe and Mail*, August 22, 2006; Gray, 1998; Mikhailov, 2001; *Petroleum Intelligence Weekly*, August 15, 2005)

All countries apply some form of *excise tax on the retail sales* of petroleum products. This has always been a sore point with the OPEC countries. The taxes collected at the retail level from consumers in the advanced industrialized countries are higher than the revenues received by the OPEC countries at the extraction end. OPEC argues that between 2000 and 2004 the G-7 western industrialized countries took in $1,600 billion in petroleum taxes while the OPEC countries received $1,300 billion in revenues. The highest take was in the United Kingdom. While UK governments have imposed very low royalties and taxes on the extraction of oil and gas in the North Sea, they have very high excise

taxes on consumers at the retail level and receive "four times more from taxation than what OPEC gets from the sale of its oil." (OPEC, 2005)

The problem of tax avoidance

The corporations in the oil and gas industry were the first truly transnational corporations, operating in different countries around the world. They invented transfer pricing as a strategy to avoid paying taxes. In many countries, like Canada, the oil and gas industry was almost completely dominated by large foreign-owned oil and gas corporations: the majors and the super majors. (Baistrocchi, 2005; Gresik and Osmundsen, 2004)

Oystein Noreng argues that even today the large IOCs have more power and operating discretion than the NOCs of the exporting countries because they have such a major presence in the refining and retailing industries. The US government and its IOCs have significant advantages from the fact that spot, term and future transactions in the oil and gas industry are made in US dollars. Because all of the TNCs engage in cross-subsidization of activities and projects, Oystein Noreng concludes that corporate income tax is "an ineffective tool to capture economic rent from oil extraction." (Noreng, 2002: 180.)

In Canada Imperial Oil (majority owned by Exxon-Mobil) has always dominated the industry and in most markets has been the price leader at the retail level. The relationship between the head office of a large TNC and its branch plant was exposed during a court case regarding Imperial Oil in Nova Scotia in the mid-1970s. Nova Scotia Power Corporation sued Imperial Oil for manipulating the price of oil. The trial showed how branch plants are controlled by their head offices. Exxon dictated to Imperial Oil where it should purchase oil and what prices to charge. The case also demonstrated how transfer pricing works. (One account of this was in *Oilweek Magazine*, May 19, 1975)

The domination of a resource industry by large TNCs has a major impact on economic development. Diderik Lund points out that in the case of small countries that operate in a basically open economy, attempts by governments to impose taxes on resource rents create a major incentive for TNCs to engage in transfer pricing or income shifting. Weak governments are not in a position to monitor and control this form of tax avoidance. Thus when economists are assessing the impact of an economic development project, Lund argues that no "welfare weight" should be given to profits, as they will flow out of the country to foreign investors. (Lund, 2001: 212)

A similar argument was made by Lawrence Copithorne, one of the Canadian pioneers in researching the impact of transfer pricing by large foreign-owned corporations. Where you have transnational corporations operating in the natural resource extraction industries, there are large leakages to foreigners. Windfall profits, extracted from consumers as a result of oligopoly, are either transferred to the head office, invested abroad or are held by the corporations as retained earnings. When these retained earnings are invested in Canada they increase the value of assets held by foreigners, and more profits flow out of the country. Thus the economic rent from oil and gas windfall profits is captured by foreigners and may be invested anywhere in the world. (Copithorne, 1979)

Bernard Mommer, a former executive of the Venezuelan NOC, Petroleos de Venezuela, Sociedad Anonima (PVDSA), and now fellow at the Oxford Energy Institute, has described in detail how the management of this NOC used transfer pricing. The oil industry was nationalized in 1976, and for a period of time PDVSA captured around 80 percent of every dollar of oil exports. However, the NOC was completely under the control of its own executives, who shared the same outlook on the industry as the executives of the private major oil corporations. After 1983 PVDSA began expanding overseas, in Germany (VEBA) and in the United States (CITGO). PVDSA sold its oil to its overseas subsidiaries at substantially discounted transfer prices, thus shifting profits abroad, outside the reach of the Venezuelan government. Profits earned overseas were kept overseas and invested overseas. Mommer states that profits were never paid to the head office of PDVSA in Venezuela. The executives at PDVSA, independent of control by the government, wished to reduce the power of the state and promote the reopening of the industry to private, foreign investment. In this they worked closely with the US government, who also wanted to see Venezuela withdraw from OPEC. The push towards privatization after 1989 was aided by President Carlos Andres Perez, leader of the social democratic Accion Democratica (AD), who signed liberalization agreements with the IMF and the World Bank. Thus when Hugo Chavez was elected president in 1998 with very strong majority support, a confrontation

with the executives of PDVSA was inevitable. (Mommer, 2002a, 2002b)

Collecting revenue from oil corporations has not been an easy task for governments. Success depends on the ability or willingness of governments to monitor and audit the corporations and then enforce existing tax laws. The corporations usually have far greater economic resources than the governments and have no qualms about engaging in litigation to avoid payments. A few examples will illustrate the problem:

- In 1996 in Texas a law suit was filed against the 13 largest oil corporations for underpaying royalties on oil extracted from land owned by the federal government and several Indian nations. They were accused of valuing their oil at below market prices. The corporations settled out of court, paying a $400 million settlement.
- In 1977 the state of Alaska sued all the corporations operating on the North Slope for failing to pay their royalties by under pricing their oil. The corporations settled out of court, paying a settlement of $1 billion.
- In California the state and the city of Long Beach brought suit against Exxon and other corporations for avoiding royalties by under pricing oil extracted from public lands. This case dragged on for 20 years, and in 1999 the corporations settled out of court for $325 million.
- The state of Alaska filed an action against Arco in 1977 for creating a "fraudulent scheme" for computing royalties but again the case was settled out of court without the corporation admitting that it had done anything wrong. (*Tax Notes International*, March 15, 2004)

Offshore tax havens

For most people the Enron case was the first time they learned anything about the intrigues within the large transnational corporations. Enron was the seventh largest corporation in the United States, an energy giant that had grown dramatically after the privatization and deregulation of the natural gas and electricity industries. Of course Enron engaged in the usual transfer pricing. However, the case revealed the extent to which the large TNCs use offshore tax havens to avoid paying taxes. Enron created 2800 subsidiaries, 881 of them abroad, and 692 in the Cayman Islands. It had no office in the Cayman Islands, but P.O. Box 1350 was the mail centre for 500 subsidiaries. By creating shell companies in the 55 infamous tax havens (which have no income taxes on corporations), Enron paid no taxes to the US government for four of the last five years before it collapsed and actually received $381 million in refunds from the US Internal Revenue Service.

Why did it take so long for the Enron fraud to become public? They were supported by top auditing firms, including Arthur Andersen, who specialize in aiding corporations in tax avoidance. They were also supported by large, powerful law firms. And they used the top Wall Street banking firms, including Barclays, Citigroup, J.P. Morgan Chase, Deutsche Bank, Credit Suisse First Boston, Lehman Brothers and Merrill Lynch. The Canadian Imperial Bank of Commerce was deeply involved. It is clearly not a case of "a few bad apples." (Lerach, 2004; "Update on UC's Enron Investment and Lawsuit," University of California, April 8, 2002 at www.ucop.edu)

The Enron case exposed the techniques used by the oil corporations and others to hide their profits. They sold oil to a subsidiary in a tax haven for a very high price and re-export it at the market price. They shifted capital to an offshore subsidiary and they borrowed it back at a high interest rate. They transferred the ownership of patents and other management services to the offshore company and then paid large royalties for their use. They bought inputs from the offshore company at highly inflated prices. These are all paper transactions, of course. (Lucy Komisar, How Big Business Evades Taxes, *Pacific News Service*, April 25, 2004; www.taxjusticenetwork.org; www.corporatepolicy.org)

These practices are very well known in business circles. Martin A. Sullivan, a tax economist for the US Treasury Department, told the New York Times that these practices are becoming common for most large US corporations. In 2003 fifty-eight percent of corporate profits were taken in offshore tax havens, "a seismic shift in international taxation." He reports that "subsidiaries of US corporations now generate profits mainly in tax havens rather than in locations in which they conduct most of their business." Would this include Canada? Saskatchewan? (David Cay Johnson, *New York Times*, September 13, 2004)

Another widely reported scandal involved Mikhail Khodorkovsky, the Russian billionaire who schemed to acquire state-owned oil and gas interests when they were privatized. He formed his own

bank, raised some capital, and bought state assets for a song. The oil and gas industry before privatization was valued at around $65 billion and was sold to a handful of "entrepreneurs" for $1.5 billion, perhaps the largest theft of public assets in modern history. Khodorkovsky became president and CEO of Yukos Oil, the largest private oil company in now capitalist Russia with a market capitalization of $6 billion. President Boris Yeltsin had not only made possible the privatization of state assets, his government also created a number of regional schemes for the new capitalists to avoid paying taxes. However, when Vladimir Putin was elected president in 2000 that changed. Putin decided it was time for corporations to pay taxes. Yukos and the other corporations were audited and presented with bills for past unpaid taxes. Yukos was given a bill of $8 billion. Khodorkovsky was charged with fraud, brought to trial, convicted and jailed.

The investigations revealed the schemes Yeltsin had created were used to allow oil companies to avoid taxes amounting to around $25 per tonne, or around $9 billion annually. There were few western companies involved in this process, but BP was in a joint project with Tymen Oil (TNK) and was accused of failing to pay $774 million in taxes. BP admitted that it engaged in transfer pricing, but said it operated within the 20 percent legal range, above and below market prices. (*Gas and Oil News*, January 11, 2001; *Petroleum Intelligence Weekly*, August 15, 2005)

Yukos was guilty of practices similar to those of Enron. They created dummy corporations abroad in tax havens. The favourites were in the Isle of Man, Geneva and Gibraltar. They used transfer pricing to shift capital abroad. They were assisted by the four largest audit firms: Deloitte & Touche, Ernst & Young, PricewaterhouseCoopers, and KPMG. These auditing firms specialize in creating tax avoidance shelters for large corporations. Yukos was also aided by Wall Street investment banks, including Morgan Stanley, Credit Suisse First Boston and UBS. (Komisar, 2005; *New York Times*, October 29, 2004)

The most recent major scandal involving the oil and gas industry concerned oil smuggling from Iraq during the period of the UN sponsored boycott and the UN oil-for-food program. The UN Independent Inquiry Committee, headed by Paul Volcker formerly of the US Federal Reserve Board, released its report on October 27, 2005. It identified 138 traders and middlemen who paid illegal kickbacks totaling $1.58 billion to the Iraq government. The traders used paper companies to try to hide the transactions, "a maze of intermediary companies." Most of the large oil traders and over 2200 companies were involved in the illegal activities. US traders Bayoil and Coastal have been indicted by the US government over strong protests from the oil industry. The smuggling was widely known and the US government and other members of the UN Security Council turned a blind eye to this activity. The scandal became public after the US/UK invasion of Iraq in March 2003. (*Petroleum Intelligence Weekly*, October 24, 2005; November 7, 2005)

Governments claim that they are doing their best to try to make large transnational corporations pay their fair share of taxes. The government of Alaska adopted the universal taxation policy, where the corporations must pay taxes based on their overall world wide performance. In 1994 the US government adopted transactional profit-based rules to try to deal with transfer pricing. In 1995 the Organization for Economic Co-operation and Development created similar guidelines. The Saskatchewan government claims to be using similar rules. However, the experience since the mid-1990s would suggest that this approach has failed rather miserably. (Gresik and Osmundsen, 2004)

v. Canadian Oil Industry

All of these developments have had a major impact on the oil and gas industry in Canada. From the beginning, the industry has been dominated by foreign-owned corporate giants. In their present form they are Imperial Oil (Exxon-Mobil), BP Canada, ChevronTexaco Canada, ConocoPhillips Canada, and Shell Canada. Other large U. S. corporations are also major players in Canada, including Anadarko Petroleum, Apache Canada, Burlington Resources, Murphy Oil Co., El Paso Corporation, Hunt Oil Company, and Devon Energy. Several large Canadian firms have emerged, including EnCana, Petro-Canada, Suncor Energy, Nexen, Canadian Natural Resources and Talisman. However, these Canadian-controlled corporations trade their stock on the New York Stock Exchange, and industry analysts argue that the majority of their stock is now owned by citizens of the United States. (US Energy Information Administration, *Canada*, February 2005.)

It is not possible here to provide a detailed history of the oil and gas industry in Canada. However, there are a number of key facts that should be kept in mind. The first Kerosene from oil was developed by a Canadian, Dr. Abraham Gesner. The world's first oil company was developed by Charles Nelson Tripp, at Eniskillen, Ontario. In 1857 they drilled the first oil well and the first Canadian refinery was established at Sarnia. However, by the turn of the century the petroleum industry in Canada was dominated by Imperial Oil, a branch plant of Standard Oil of New Jersey. (Gray, 1969)

The Leduc field near Edmonton was not discovered until 1947. Prior to that time almost all of the oil consumed in Canada was imported, mostly from Venezuela and the United States. All of the large oil refineries were owned and controlled by the foreign-owned majors, and most were sited in Ontario and Quebec. They had their own lobby and public relations group, the Canadian Petroleum Association, which was very influential in Ottawa.

As the petroleum industry developed in Alberta, Canada emerged with two markets. The Alberta producers served the western Canadian market and began exporting to the United States. The larger eastern Canadian market was controlled by the majors using cheap imported oil. The majors made most of their income in Canada from refining rather than extraction.

The Canadian corporations formed their own organization, the Independent Canadian Petroleum Association, and pressured the Canadian government to create a national oil policy. They wanted oil from western Canada to replace the imported oil in the eastern market. Alberta oil was more expensive to extract than imported oil, and this would have significantly raised the price of petroleum products.

The majors convinced the Canadian government, then headed by Saskatchewan's Prime Minister, John Diefenbaker, to reject the proposal from the Canadian industry based in Alberta. The resulting compromise was the National Oil Policy of 1961, which divided the country into two markets along the Ottawa Valley Line. The Seven Sisters were to control the market east of this line, using cheaper imported oil. The Canadian companies would have the market to the west of the line. The new oil policy allocated the important Ontario market to western Canadian corporate interests. This meant that consumers west of the Ottawa Valley line would pay a monopoly price for petroleum products. The corporations developing the industry in Alberta and Saskatchewan were instructed to find additional markets for their increasing production in the United States. There would be no integrated Canadian market for oil. Today, few people in Alberta choose to remember the first National Oil Policy.

The new policy had the strong support of the US government, which had as its goal an integrated North American resource market. The National Oil Policy would continue the domination of the

Canadian industry by the big US oil corporations, keep Canada dependent on imported oil, and expand the export of western Canadian oil to the United States. It wasn't until 1974 that Canada became a net exporter of oil. (Crane, 1982; Foster, 1979; Laxer and Martin, 1976; Richards and Pratt, 1979)

Canadian opinion on the oil and gas industry changed radically over the 1960s and 1970s. Several important studies decried the extent of foreign ownership and control of Canadian industry in general. The oil and gas industry was the most obvious example, and public concern was expressed when it seemed that the majors would also control the development of the tar sands and the frontier lands of the Arctic and offshore. Following the OPEC crisis of 1973, the Liberal government under Pierre Elliott Trudeau created the Foreign Investment Review Agency in an effort to halt the takeover of Canadian firms by foreign corporations. In 1975 they created Petro Canada, a state-owned corporation similar to those that existed in western European countries.

However, the bombshell was dropped on October 28, 1980: the new National Energy Program. The NEP was a complicated package, but there were three main objectives. First, policies and programs would be implemented to allow Canadian control of the industry to rise from 25 percent in 1980 to 50 percent by 1990. Second, PetroCanada, and other possible Canadian-owned oil corporations, would take over a significant number of foreign-owned majors. Third, there would be an increase in the share of the oil and gas industry owned directly by the people of Canada through Crown corporations. There were other provisions in the NEP that were not widely known. One goal was to reduce the use of oil in the non-transportation sector to no more than 10 percent of the total. Oil consumption would be reduced by 390,000 barrels per day, roughly the equivalent of imported oil at the time.

There was fierce opposition from the oil industry and business organizations in general. The US government under President Ronald Reagan strongly expressed its opposition. The business press was adamantly opposed. The *Wall Street Journal* editorialized that the Canadian government was acting like a Third World oil producing country and not like "a key democracy in the industrialized world." They argued that Canada could not have developed the oil and gas industry without the support of the oil majors. Needless to say, there was strong opposition to the NEP in Alberta. Through their regulation of the oil industry by the Alberta Petroleum Marketing Agency, Peter Lougheed, the Alberta Progressive Conservative Premier, announced that the government would cut back production and sales in three steps to 85 percent of their current level.(Crane, 1982; Foster, 1982; Richards and Pratt, 1979)

Promoting continental integration of the oil industry

Canada has always played a supportive role in the Anglo-American alliance to dominate the world. When the greatest imperial and colonial power was Great Britain, Canada was there as a white Dominion, giving strong political, military, economic and natural resource support. This changed during World War II. With the United States emerging as the supreme world power, Canada shifted its allegiances. During the war, military policy was closely integrated with that of the United States, and there was deep integration in the development of natural resources, manufacturing and the arms industry. Canada's overall policy as a supportive and subordinate ally was continued after the war; the justification was now the Cold War against the Soviet Union and its allies.

During the Korean War (1950-3) President Harry Truman appointed William Paley to head a Materials Policy Commission to look at the long term needs of the US government and economy for strategic natural resources. Many key materials were being depleted, and there was the need for a secure future source of oil and natural gas. The commission concluded that historically the government had relied on a close relationship with major US corporations, and that relationship should continue. There was no need to develop state-owned corporations, as was being done in many European countries, even Great Britain. The US government would actively support investment by US corporations in countries in the Western hemisphere. Canada was singled out as being the most secure source of strategic materials and most receptive to US needs. (Laux and Molot, 1988; Paley, 1952; Tanzer, 1980)

On several occasions the US government negotiated seriously with the Canadian government to establish a continental energy pact. Liberal governments, with a long history of supporting continen-

tal integration with the United States, were supportive. However, they backed off when the existence of the negotiations became public. Canadian opinion was opposed to making any long term commitment to sharing our oil and gas with the United States.

In the period after the Korean War US policy stressed the further development of the US industry. Voluntary and mandatory controls were put on oil imports, but Canada was always exempted. During the conflicts in the Middle East in 1956 and 1967 Canadian exports to the United States increased, and the pipeline to Chicago was doubled in size. (Shaffer, 1968)

In 1965, as the United States was becoming more deeply involved in the Vietnam War, the Canadian and US governments released the Merchant-Heeney Report, best known for its proposal that the Canadian government not publicly criticize US foreign and defence policy. The proposal, which was not well received in Canada, called for joint planning for the development of resources and "the co-ordination between the two countries in the production and distribution of energy" (Clause 64). (Crane, 1982)

The Canadian public's opposition to continental energy integration was again aroused with the release in 1970 of a study by US Secretary of Labor, George P. Shultz. It proposed that Canada phase out its dependence on oil imported from Latin American and the Middle East and create a single North American market for oil and gas protected by a mutual tariff system. Canada was identified again as the most secure and reliable source of oil for the US military machine. Joe Greene, the Canadian Minister of Energy, Mines and Resources, created a stir when he spoke to the US Independent Petroleum Association in Denver in 1970. He revealed that the government of Pierre Elliott Trudeau was seriously studying the proposals by the US government for an integrated North American energy policy. Greene, repeating the position of the Seven Sisters in Canada, declared that Canada had oil reserves that represented 923 years of supply, and natural gas reserves that represented 392 years supply. Therefore, Canadians should have no concern about greatly expanding exports to the United States. (Crane, 1982; Foster, 1979; Laxer and Martin, 1976)

The election of Brian Mulroney and the Progressive Conservatives in 1984 opened the door to further continentalism. Shortly after assuming office Mulroney went to New York City to speak to prominent businessmen, to let them know that the era of Canadian nationalism was over. He declared that he was going to abolish the National Energy Program and the Foreign Investment Review Act as soon as possible. In March 1985 his government signed the Western Accord with the governments of Alberta, British Columbia and Saskatchewan, which proclaimed a "free market" approach to the oil and gas industry, phased out the federal Petroleum and Gas Revenue Tax, and promised tax incentives for the oil and gas industry. The new policy direction was praised by the Canadian Petroleum Association.

On October 3, 1987 the Mulroney government released the draft of the new Canada-US Free Trade Agreement (FTA). Nearly everyone was astonished to see that the draft included a continental free trade agreement in energy. Not even the provincial premiers knew this area had been included in the negotiations. (Dillon, 1983)

The provisions relating to energy represented a dramatic loss of sovereignty for Canada. If there is a shortage of energy in Canada, the federal government cannot reduce the proportion exported to the United States below the level exported to them over the past three years (Article 904). The Canadian government is specifically denied the right to control intra-corporate transfers of "profits, royalties, fees, interest or other earnings" (Article 1606). The Canadian government cannot introduce a two price system for energy, charging a higher rate for exports (Article 904). The Agreement also stripped the National Energy Board of the power to set minimum export prices and export taxes (Article 903). No future national energy programs can discriminate in favour of Canadian-owned corporations (Article 904). These basic principles of a continental energy program were strengthened in the subsequent North American Free Trade Agreement (NAFTA), which included Mexico, and came into effect in 1994. The government of Mexico was unwilling to surrender complete control over its oil industry and was granted an exemption from the proportional sharing clause. (Dillon, 1983; McBride and Shields, 1997)

Canada and the rise of windfall profits

Everyone is well aware of the rise of oil prices in recent years. There are different world prices of course, depending on the regional market and the quality of the oil. Heavy crude oil produced in west-

ern Canada, for example, is discounted significantly against light crude oil, usually over $10 per barrel. However, on average, oil prices have been steadily increasing in recent years. For example, North Sea Brent oil went from around $18 per barrel in 1999 to $40 per barrel in 2004. In 2005 world oil prices reached a peak of around $70 per barrel before dropping back to around $55 to $60 per barrel. However, by the middle of 2006 they had again risen to a high of $78 per barrel and then dropped off to $60. These price increases bear no relationship to the cost of production. There has been inflation in the cost of production over recent years, but this has been far below the price increases. The US Department of Energy reports that in 2003 the production costs (including royalties) for oil in Canada averaged $5.57 per barrel. The oil industry in Canada has benefited from a rather dramatic increase in "windfall profits." Of course, in the producing countries with national oil companies and much higher royalties and taxes the governments have largely captured the excess profits (US Energy Information Administration, 2003).

The price of natural gas has varied more than crude petroleum, but the general trend has been toward higher prices. The average price of natural gas at the Alberta hub went from around $2 per gigajoule (approximately equal to 1,000 cubic feet) in 1998 to $4 in 2002 to over $6 in 2004. In 2005 the price rose to between $8 and $14 and then declined because of the unusually warm winter, which lowered demand. This was followed by a mild summer and no hurricanes and an increase of gas in storage. Consequently, by the fall of 2006 natural gas prices had fallen to $5 per gigajoule.

Despite these short-term fluctuations as natural gas supplies in western Canada continue to diminish, and the general market demand continues to increase, it is inevitable that prices will rise over the long run. And even the lower prices still exceed costs - the US Department of Energy reports that production costs for natural gas (including royalties) in Canada in 2003 averaged between $2.55 and $3.25 per thousand cubic feet. Again, the private sector has reaped windfall profits. (SaskEnergy, 2005; US Energy Information Administration, 2003)

The major oil corporations are all reporting windfall profits. By mid-2005 the six super majors had reported that their declared profits were up 29% over 2004. What have they done with the excess profits they have accumulated? First, the oil and gas corporations are holding a lot of cash as retained earnings. At the end of 2004 the five largest Canadian firms held the following amounts:

Company	2005 revenues ($Millions)	retained earnings ($Millions)	% revenues
EnCana	US$ 12,241	US$ 7,935	64.8
Petro-Canada	14,687	5,408	36.8
Talisman Energy	9,554	3,316	34.7
Canadian Natural Resources	7,547	4,922	65.2
Nexen	3,905	2,335	59.8

SOURCE: Corporation Annual Reports, 2005

Some resource economists argue that for the oil and gas industry in particular, retained earnings are a good indication of the level of the economic rent (or excess profits) that are accumulated by the large private corporations. (Copithorne, 1979)

Second, most of the large oil and gas corporations have put a very high priority on buying back their own stock. Stockholders like this for it increases the value of the stock and the returns per share. For example, between 2000 and the middle of 2005 the five super majors spent a great deal of their cash buying back their stock: Exxon, $36 billion; BP, $18 billion; Total $17 billion; Shell, $7.5 billion; and Chevron, $5 billion. Several of these corporations have spent more on buying back their own stock than they have on capital expenditures. (*Petroleum Intelligence Weekly*, August 8, 2005; October 3, 2005)

Third, they have paid higher dividends to their investors. The *Globe and Mail Report on Business* found that for 2003 the Big 10 Canadian oil companies' return on capital invested for one year ranged from a low of 18 percent (Talisman Energy) to a high of 34 percent (Imperial Oil). The five year return was in the same range. The *Oil and Gas Journal* reports that in 2004 the return on stockholder equity for the large US oil corporations was consistently 30 percent or more. In determining what is a fair rate of return on equity (ROE) for calculating economic rent in resource extraction, economists commonly use a real rate return of 4.5 percent. (*Oil and Gas Journal*, September 19, 2005;

Report on Business, July/August 2004)

Fourth, they are adding reserves through mergers and acquisitions. Many industry analysts as well as political observers have noted that the private corporations have not been spending much on exploration. New wells drilled have been largely in developed fields, to increase the rate of extraction. For most oil and gas corporations, production has exceeded the addition of proved reserves. Access to new prospective drilling sites has been limited; in many cases prime properties have been snatched up by the large NOCs. One alternative to this situation has been for larger IOCs to buy out smaller independents. In 2004 mergers and acquisitions numbered 251 with a value of $68.3 billion, a level that had been reached about half way through 2005. There has also been a rash of mergers among the larger corporations over the past 15 years. In 2005 many of the large oil corporations sought to increase their proven reserves by purchasing existing assets from other companies, and the price paid for acquisitions has risen significantly. In 2003 the average acquisition price of reserve assets was around $4.81 barrel of oil equivalent (BOE). The value of assets purchased in Canada in 2005 rose to $13/BOE. Outside North America reserve assets acquired averaged only around $1.49/BOE in 2004. With so much cash on hand, many large corporations have committed very large investments (up to $10 billion) in Alberta tar sands development projects. (*Petroleum Intelligence Weekly*, September 12, 2005; October 24, 2005; *Oligopoly Watch*, June 12, 2004 at www.oligopolywatch.com)

Foreign ownership

For Canada there is always the problem of the high degree of foreign ownership and control. The oil and gas industry is certainly no exception. In 1999 US ownership of the oil and gas industry was at 31 percent but it had risen to 51 percent by 2003. With the large Canadian oil companies all selling shares on the New York Stock exchange, US ownership is steadily increasing. In September 2005 the Canadian Oil Sands Trust reported that its US ownership had risen to 46 percent. (*Globe & Mail*, September 30, 2003; *Globe and Mail*, September 3, 2005)

While the large Canadian oil companies are based in Canada and run by Canadian citizens, their ownership is changing. The majority of shareholders of three of the major Canadian companies - EnCana, Suncor and Canadian Natural Resources - are US residents. (*Globe and Mail*, October 7, 2005).

Even the oil and gas trusts, set up to allow corporations to avoid paying the federal corporate income tax, have a very high percentage of US ownership, many well above the 49 percent ceiling supposedly set by the federal government. The general problem can be seen in recent years in the growth of the outflow of capital. (Jackson, 2005; Yedlin, 2005)[3]

Net Flow of Foreign Direct Investment in C$billions

	1999	2000	2001	2002	2003	2004
Inflow	36.8	99.2	42.6	33.0	9.2	8.5
Outflow	25.6	66.4	55.9	41.5	30.2	57.5
Net Flow	11.2	32.8	-13.3	-8.5	-21.0	-49.0

SOURCE: Statistics Canada.*Canada's Balance of International Payment, 2005*.

Statistics Canada also reports that there has been a large and growing outflow of capital to offshore tax havens. This would certainly include the oil and gas sector of the economy. (Statistics Canada, *The Daily*, March 14, 2005)

[3]The recent federal proposal to tighten trust taxation rules anticipates a phasing-in period. It remains to be seen whether energy sector lobbying will result in weaker rules for the sector.

VI. The Oil Industry in Saskatchewan

Most oil extracted in Canada comes from the Western Canadian Sedimentary Basin (WCSB), which lies under Alberta, Saskatchewan, part of Manitoba, British Columbia, and the Northwest Territories. This basin is considered "mature" as the extraction of conventional light and medium oil has been declining for a number of years. The National Energy Board projects that only 22 percent will be recovered over all, and emphasis now is on heavy oil and enhanced oil recovery (EOR), both of which are less profitable than light oil. While the amount of oil extracted by conventional and EOR is steadily declining, it has been offset by the increased extraction and processing of bitumen from the tar sands in Northern Alberta. (National Energy Board, 2005; US Energy Information Administration, April 2006)

The recent study by Natural Resources Canada of our energy future concludes that conventional light and heavy crude oil in Western Canada has reached the mature stage and production is starting to decline. The production peak is set for 2006 at 1.48 MMb/d and is expected to drop to 0.84 MMb/d by 2020. The potential light and heavy crude oil for Saskatchewan is estimated to be 3.8 billion barrels. (Natural Resources Canada, 2006)

A commercial oil industry began in Saskatchewan in the 1930s, but it was not until the mid-1950s that production began on a major level. By 1962 the annual volume extracted had risen to 10.2 million cubic metres (64 million barrels). Production first peaked at 14.8 million cubic metres (93 million barrels) in 1966 and then dropped off to a low of 7.4 million cubic metres (47 million barrels) in 1981. From that time on there was a steady increase in production, which reached its second peak in 2000 at 24.3 million cubic metres (153 million barrels). (For a short history of the oil industry in Saskatchewan see Warnock, 2005)

The increase in production has been made possible by the expanded extraction and processing of heavy oil, new technologies like horizontal wells and enhanced oil extraction, plus a general increase in oil prices. However, throughout the WSCB conventional oil production peaked around 1971 and has since been steadily declining. Saskatchewan produces about 20 percent of the Canadian total. In 2004 73 percent of Saskatchewan's oil was exported to the United States, 17 percent went to Alberta and Ontario, and around 10 percent was consumed in the province.

The oil industry is important to the Saskatchewan economy, but its value is almost always overstated. In 1995 the oil and gas industry contributed 7.6 percent of the provincial gross domestic product; this fell slowly to 6.0 percent in 2002. Employment in the industry has been rising in recent years, from 1,912 in 1995 to 2,289 in 2002. However, the share of total employment in the Saskatchewan economy has remained steady at 0.5 percent. (Taylor et al, 2004)

Everyone knows that this industry is very capital intensive. Statistics Canada shows that the fixed capital per worker for the industry is around $790,000, the highest of any industry. This compares to $38,000 for manufacturing and $4,250 for business services. (Stanford, 1999).

In his survey of the oil and gas industry in Saskatchewan, Erin Weir points out that the contribution to the Saskatchewan economy is greatly reduced by the fact that the industry is "overwhelmingly headquartered outside the province." The linkages to the economy are significantly reduced because manufactured inputs come from outside the province. Weir argues that if Saskatchewan were interested in job creation, it would make sense to raise royalties and taxes on the oil industry and invest them in any other sector of the economy. This was the rationale used by the government of Allan Blakeney to raise royalties and taxes. (Weir, 2002)

It should be noted that between 1982 and 2002 the consumption of crude oil in Canada increased by 29 percent while exports to the United States

increased by 590 percent. Exports of oil to the United States steadily rose to reach 1.7 million barrels per day by 2004. In 1985 Canada exported 33 percent of oil extracted to the United States; this rose to 67 percent in 2004. Today Canada imports almost one-half of its crude oil requirements, used primarily by refiners in Quebec and the Atlantic provinces. (Saskatchewan Bureau of Statistics, *2005 Economic Review*, 2006; US Energy Information Agency, 2005; National Energy Board, 2005)

Established reserves

There are different estimates of the amount of oil that has been identified and can be extracted using present technology and given the economics of the time. It is always assumed that the technology for extraction will improve and the extent of available reserves will increase. It is also assumed that as this most important fuel source is depleted, or extraction fails to keep up with demand, the price of oil will increase and reserves that are more costly to exploit will become useful. At some point it will be necessary to examine the issue of energy balance: energy in for energy out. However, given the dependence on oil for transportation, and its central role in major military systems, it seems likely that under the present economic system government subsidies to the industry will rise even further than they are today. Several different estimates for Canada's established reserves are found in this table:

Canada's established conventional oil reserves in 2004-5

	billion barrels
Canadian Association of Petroleum Producers	4.4 billion
U.S. Energy Information Administration	3.8 billion
Statistics Canada	2.9 billion

SOURCE: CAPP at www.capp.ca; US Energy Information Administration at www.eia.doe.gov; BP Statistical Review at www.britishpetroleum.com; Statistics Canada, *Human Activity and the Environment*, Annual Statistics 2005, Catalogue No. 15-201-XIE.

All the major sources of energy statistics report that conventional reserves of oil in the WCSB and Canada are in decline. Despite the steady increase in the number of wells drilled, extraction exceeds the addition of new reserves. Statistics Canada records that in 1985 established reserves of conventional and offshore oil were around 5 billion barrels; this declined to 2.9 billion barrels in 2003. The reserve life of this resource at current rates of consumption has declined from 11 years to seven years. (Statistics Canada, 2005)

There is no question but conventional oil is disappearing in the WCSB. The number of oil wells drilled in Alberta peaked at 5304 in 1997; in that same year, they peaked in Saskatchewan at 3059. The size of pools discovered peaked in the mid-1980s and has been steadily declining since. The Canadian Association of Petroleum Producers reports that the remaining established reserves of conventional crude oil in Canada peaked in 1970 at 1,665 million cubic metres (10,490 million barrels) and this declined to 714 million cubic metres (4,498 million barrels) by 2003. The Canadian Energy Research Institute reports that the average productivity of conventional oil wells in the WCSB has declined from around 33 barrels per day (bbls/d) in 1994 to only 18 bbls/d in 2003. (CAPP, *Statistical Handbook 2003*; CERI, 2005; Tertzakian and Baynton, 2006)

The recent overview of the industry by the National Energy Board reveals that most of the drilling for conventional light oil in the WCSB is "to develop the remaining small undiscovered pools in selected areas of the basin, revisit the existing larger pools to implement EOR schemes, or in fill drilling to a smaller spacing size." There are new zones being explored for conventional heavy oil, searching for "small undiscovered pools," but most of the emphasis is on applying EOR schemes. Improved "fiscal regimes" (meaning lower royalties and taxes) have encouraged this development. The WCSB is "a maturely explored basin, with diminishing finding rates and relatively high finding and development (F&D) costs." In 2004 of the conventional wells drilled in the WCSB, around 3,700 were for expanding extraction in oil fields presently being developed and only around 600 were for exploratory purposes. (National Energy Board, 2005)

Average recovery rates for conventional oil wells are rather low at 27 percent for light and 15 percent for heavy. Improved technology, higher oil prices, and additional state support may improve recovery in the future. Nevertheless, both the oil industry and governments agree that the future of oil production in Canada is in the Alberta tar sands.

(National Energy Board, 2005; Woynillowicz, 2005)

Trends in the extraction of oil

Conventional oil flows from the ground or can be pumped from a well without diluting or heating. Oil is classified as light, medium, heavy or extra heavy according to its gravity. This is determined by using a scale that was created by the American Petroleum Institute, known as the API index.

light crude: higher than 31.1 degrees (lower than 870 kg/cubic metre)

medium crude: between 31.1 and 22.3 degrees (870 to 920 kg/cubic metre)

heavy crude: between 22.3 and 10 degrees (920 to 10,000 kg/cubic metre)

extra heavy crude (bitumen): less than 10 degrees (higher than 1000 kg/cubic metre)

The trends in the extraction of conventional oil in Saskatchewan can be seen in the following table:

Crude Oil Statistics for Saskatchewan

Extraction in Millions of Cubic Metres

Year	Light Gravity	Medium Gravity	Heavy Gravity	Total
1997	6.2	7.4	9.8	23.4
1998	6.1	7.7	9.4	23.2
1999	5.3	7.1	9.2	21.7
2000	5.5	7.2	11.6	24.2
2001	5.4	7.1	12.2	24.8
2002	5.1	6.9	12.3	24.4
2003	5.1	6.6	12.7	24.3
2004	5.1	6.4	13.1	24.6
2005	5.3	6.5	12.6	24.3

SOURCE: Saskatchewan Bureau of Statistics, *2005 Economic Review*.

The extraction of light crude oil in Saskatchewan peaked at 6.2 million cubic metres (39 million barrels) per year in 1997. Medium oil extraction peaked in 1998 at 7.7 million cubic metres (48.5 million barrels) in 1998. The future for crude oil extraction in Saskatchewan depends on the increased availability of heavy oil, which has risen from 9.8 million cubic metres (61.7 million barrels) in 1997 to 12.6 million cubic metres (79.4 million barrels) in 2005. Overall, total oil extraction in the province has been steady at around 24 million cubic metres (151.2 million barrels) since 2000.

Around 52 percent of the oil extracted in Saskatchewan today is heavy oil. The oil in the Lloydminister region has an API Gravity rating of between nine and 18 degrees. In order for this oil to be transported by pipeline, it has to be diluted with a condensate. Currently there is a shortage of condensate (a lighter liquid hydrocarbon), and its price is also rising. Heavy oil also includes a greater range of impurities that must be removed before it can be refined. These impurities include sulphur, heavy metals, waxes and carbon residue. (Saskatchewan Bureau of Statistics, 2006; Canadian Centre for Energy Information www.centreforeenergy.com)

The Canadian Association of Petroleum Producers (CAPP) provides data on the industry collected from its members. These data show that most drilling in Saskatchewan in recent years has been to increase extraction from existing pools rather than searching for new sources (see table next page):

Saskatchewan Drilling Activity 2003

	Oil Wells	Metres	Gas Wells	Metres
New Field Wildcats	19	19,552	61	45,422
New Pool Wildcats	41	43,833	188	133,930
Deeper Pool Tests	1	3,100	- - -	- - -
Shallower Pool Tests	6	2,334	1	815
Outposts	217	193,333	498	296,806
Total Exploratory Tests	284	262,142	748	476,973
Development Wells	1,339	1,484,812	1,539	896,659
Total Completions	1,623	1,746,964	2,287	1,373,632

SOURCE: Canadian Association of Petroleum Producers, *Statistical Handbook 2003*.

Saskatchewan's established reserves of conventional oil have been estimated to be around 1.2 billion barrels by both the Department of Industry and Resources and the Canadian Association of Petroleum Producers. At the current annual rate of extraction of 152 million barrels, established reserves would last for around eight years. (CAPP, *2004 Petroleum Reserves Estimate*, www.capp.ca; Saskatchewan Department of Industry and Resources, *Crude Oil in Saskatchewan*, January 2005)

The price of oil varies according to its quality for refinement. The price commonly reported in the news is West Texas Intermediate (WTI) at Cushing, Oklahoma. It is a high quality light crude oil with a low sulphur content. However, only a small percentage of the oil extracted in Saskatchewan meets this quality standard, and thus prices for Saskatchewan oil are significantly less. In 2005 the average price of Saskatchewan oil was C$35.69 per barrel, or only around 70 percent of the price of WTI Cushing oil.

The exchange rate between the US and Canadian dollar is also a factor. Saskatchewan oil sold in the United States brings an additional premium, as it is sold in US dollars. As the value of the Canadian dollar moves up against the US dollar, the returns to corporations extracting oil in Saskatchewan declines. (*Saskatchewan Budget Papers*, April 2006)

A quick overview of the industry can be seen from the following table, which reports the volume of oil extracted, the gross value of sales, and the royalties received by the province. They show the increase in crude oil production, the rise in value of sales as world prices increase, and the decline in the share of economic rent going to the province in the form of royalties, land bonus bids and lease rentals.

Saskatchewan Petroleum Production Sales and Royalties (>000)

Years	Barrels Sold	Values of Sales	Royalties	Royalties /Sales
1972-5	305,537	$1,252,462	$319,730	24.9%
1976-8	178,013	$1,712,149	$722,611	42.1%
1979-82	215,460	$3,599,512	$2,034,338	56.5%
1983-6	275,096	$6,945,576	$2,439,283	35.1%
1987-91	382,492	$6,642,140	$2,297,767	19.5%
1992-5	405,052	$7,139,066	$1,234,421	17.3%
1996-9	562,313	$11,124,547	$1,986,132	17.9%
2000-5	923,775	$30,619,560	$4,861,536	15.9%

SOURCE: Saskatchewan Industry and Resources, *Annual Reports*. Saskatchewan Bureau of Statistics, *Mineral Statistics Yearbook*. Government of Saskatchewan, *Budget Estimates for Fiscal Year ending March 321, 2006*.

NOTE: Since the collection of royalties and taxes is a political decision, years have been grouped according to different elected governments.

The general political economy approach of different governments is also revealed. During the NDP government of Allan Blakeney (1971-1982) the share of economic rent going to the public was increased. The Progressive Conservative government of Grant Devine (1982-1991) began the process of lowering royalties and granting a larger share of the economic rent to private oil and gas corporations. This trend was continued by the NDP

governments of Roy Romanow and Lorne Calvert (1991-present).

Industry profits, royalties and taxes

It is very difficult to determine the profitability of the oil industry in Canada. The firms are very secretive in their operations. We don't have state owned industries or joint ventures that can provide the public with an inside view of how the industry operates. All of the large oil corporations engage in transfer pricing, and the use of offshore dummy corporations has become a norm.

In addition, there are large subsidies to the industry from all levels of government.

At the federal level subsidies include the Canadian Exploration Expense, the Canadian Development Expense, the Canadian Oil and Gas Property Expense, a favourable capital cost allowance/depreciation that is accelerated for new oil and gas projects, the Resource Allowance, the Mineral Exploration Tax Credit and the Flow-through Shares Tax Credit. The federal corporate income tax rate applied to the oil and gas industry is steadily being reduced. As a result, the effective tax rate on the industry is the lowest in Canada aside from the forestry industry. (Canada Department of Finance, March 2003)

A recent study by the Pembina Institute reported that in 2002 the industry received $1,446 million in subsidies from the federal government alone. In addition, governments in Canada and in other industrialized countries have been steadily reducing the royalties and taxes on the petroleum industry; the foregone rent is a direct subsidy. Then there is the fact that the environmental, health and social costs of the industry are externalized from the corporations, passed on to the general public. (Taylor et al, 2005)

Eric Reguly, business columnist for the *Globe and Mail*, has chastised provincial and federal governments. "Why should taxpayers have to subsidize the world's most profitable product?" He characterized the reduction of royalties in Alberta as "one of the biggest energy giveaways ever." (Reguly, 2006)

The extensive subsidies, and the decrease in the percentage of the economic rent that is captured by the provinces through royalties, combined with the rapidly increasing price for oil, has resulted in steadily increasing depreciation, depletion and amortization (DD&A) reported by the oil and gas corporations. The widely-cited report by Benjamin Financial Solutions in Calgary cites the major increase in DD&A in Canada: from $8.58 per barrel of oil equivalent (BOE) at the beginning of 2002 to $12.55 in the third quarter of 2004. DD&A is one way of hiding excess profits, and this is reflected in the dramatic increase in retained earnings reported by the oil and gas corporations. Over the same period of time Benjamin reports that production costs have risen from $5.96 BOE to $7.58 BOE. (A Benjamin Report", *Oilweek*, April 2005)

This parallels developments in the industry on the world wide basis. A study by Honore Le Leuch for Beicip-Franlab, an IFP Group company, presented at an international conference on the oil industry in June 2005, found that between 1999 and 2004 the average "technical costs" of extracting oil by the major oil corporations had risen from $7 BOE to $10 BOE. This includes exploration costs ($0.5 to $1), development costs ($3 to $5) and production costs ($2.5 to $5). Over that same period the average North Sea Brent oil price rose from $18 BOE to $38 BOE. The rent from the extraction of oil (surplus over costs including a normal return on investment) rose from $10 BOE to $28 BOE. How this monopoly profit is shared between private corporations and governments varies from country to country. (Le Leuch, 2005 at www.ifp.fr)

The National Energy Board has produced similar figures. On a world wide basis finding and development (F&D) costs rose on average from $6 a barrel in 1999 to $8.50 in 2003. The cost of extracting oil has risen as the easily accessible fields are being depleted. However, these costs are far less than the increase in the price of oil. (National Energy Board, September 2005)

The highest cost of production in Canada is that of the Alberta tar sands. In 2003 Syncrude was reporting that operating costs were around $16 per barrel. The Canadian Energy Research Institute reported in 2004 that for new tar sands projects "a WTI price of US$25 per barrel would enable an oil sands project developer to cover all costs and earn a 10% return on investment." In 2003 the National Energy Board concluded that a price of "US $22 per barrel provides adequate returns to support investment in the oil sands and offshore oil development." (*Globe and Mail*, November 4, 2003; Dunbar, 2004; National Energy Board, July 2003)

However, with the dramatic increase in investment in the Alberta tar sands industry, costs began to rise significantly. Labour shortages emerged. Industrial parts became scarce. Natural gas prices

rose as supply was stretched. As a result Shell Canada announced in 2005 that expansion at their Athabasca Oil Sands Project would require the price of oil to rise from $20 to $30 per barrel. Given that at the time the international price had risen to $65, the investment seemed more than justified. (*Globe and Mail,* August 10, 2005)

The Pembina Institute recently undertook a study of the economic rent produced in the oil and gas industry in Canada. The data was provided by the Canadian Association of Petroleum Producers, voluntarily provided by the oil and gas corporations operating in Canada. Pembina also compared government royalty and taxation policies in Canada with Norway and Alaska, where frontier oil and gas extraction has higher costs. The conclusions are summarized below:

Government Oil and Gas Revenues, 2002

Region	Government Revenues ($ million)	2000$ /BOE
B.C.	1,695	8.1
Alberta	9,063	6.8
Saskatchewan	1,166	5.9
Yukon	11	4.5
Northwest Territories	63	4.5
Alaska	4,852	10.5
Norway	29,396	18.1

SOURCE: Pembina Institute: Amy Taylor et al, *When the Government is the Landlord*. Calgary, July 2004.

Alaska captures rent through royalties, bonus bids, and income taxes, and also has a production tax that captures additional rent when prices rise. Norway captures the largest share of resource rents by having an additional "special tax" of 50 percent, designed to capture a major share of excess or monopoly profits. In addition, Norway has StatOil, a state-owned oil and gas corporation that directly operates in the North Sea and around the world, on its own or through joint ventures. Dividends from these operations accrue to the citizens of Norway rather than private investors. (Taylor et al, 2004)

The cost of extraction and processing of oil in Saskatchewan is reported to be higher due to the increased dependence on lower grade heavy oil. When the Lloydminister Heavy Oil Upgrader was being constructed, Li Ka-shing, the Hong Kong owner of Husky Oil, often stated that the operation would be profitable when the price of WTI light crude was at $18 per barrel. In 2002 Saskatchewan Energy and Mines reported that "reasonable levels of conventional activity can be maintained at the West Texas Intermediate (WTI) price of $20 US per barrel." An expansion of the heavy oil industry in the province through the use of enhanced oil recovery (EOR) would "require a WTI price in excess of $20 US per barrel." (Saskatchewan Energy and Mines, *Oil in Saskatchewan*, 2002 at www.gov.sk.ca/enermine/facts.semoil.htm)

The Canadian Association of Petroleum Producers collects information from its members and then publishes data every year in its *Statistical Handbook*. Most people doing research rely on CAPP for basic information on the industry. But how accurate are these data? CAPP is an industry organization engaged full time in promoting the interests of its private corporate members. Their cost of production figures are regularly higher than those from other sources.

One source of industry profitability comes from the US Energy Information Administration. Under provision of law, the 28 largest oil and gas corporations doing business in the United States are required to annually complete a detailed questionnaire on all their operations. The corporations must report the costs of production and the royalties and taxes paid. The survey includes most of the major corporations operating in Canada including Exxon Mobil, BP, Shell, ChevronTexaco, Total, ConocoPhillips, Devon Energy, Sunoco, CITGO, Burlington Resources, Murphy Oil, El Paso Corporation, Unocal, Hunt Oil, Anadarko, Apache, etc. Their report for 2003 finds that Canadian lifting (or production) costs are the highest in the world at $5.34 per barrel, but royalties and taxes are among the lowest at only $0.23 per barrel.

Production Costs by Region for U.S. Based Corporations, 2002-03
US$ Per Barrel of Oil Equivalent

Region	Direct Lifting Costs	Royalties and Taxes
Middle East	3.99	0.15
Canada	5.34	0.23
Eastern Europe/FSU	4.43	0.75
OECD Europe	4.39	0.84
Other Eastern Hemisphere	2.97	1.09
Total USA	3.77	1.13
Africa	3.89	1.32
Other Western Hemisphere	2.14	1.45

SOURCE: U.S. Energy Information Administration, *Performance Profiles of Major Energy Producers 2003*. Washington, D.C.: U.S. Department of Energy. Accessed at www.eia.doe.gov

NOTE: Figures for royalties and taxes for the Middle East are skewed because almost all oil and gas is extracted by state-owned national oil corporations, and most operations with independent oil companies are production sharing agreements.

A study of the financial status of the Canadian oil and gas industry done by ARC Financial Corporation of Calgary, an investment management company focusing exclusively on energy concludes, "The oil and gas industry is currently the most profitable sector in Canada." And this even though the study was done for the Canadian Association of Petroleum Producers using their statistical data and generally higher cost estimates. For conventional oil and gas, ARC Financial reports that average unit operating costs have risen from around $4.00/BOE in 1995 to around $7.00/BOE in 2006. These figures do not include general and administrative costs (G&A), which in 2006 were an additional $1.95/BOE. For the Alberta tar sands, there is a drop in costs beginning in 1997 and then a steady increase to $17.00/BOE in 2006. Tar sands oil costs have been greatly affected by the rise in natural gas prices and wages for skilled operators.

ARC Financial stresses that conventional land prices in the WCSB have been "inflating at about 50 percent per year over the past three years. Combined with the effects of maturing geology, Canada remains one of the highest cost regions in the world for oil and gas exploration and development." The higher dependence on heavy oil in the WCSB results in lower average prices. Bow River at Hardisty Crude Oil went from an average of $25.07/bbl in 2000 to $45.65/bbl in 2006. Prices for heavy oil reflect a discount of about 35 percent from WTI light crude oil. (Terzakian and Baynton, 2006)

The high world prices for oil over the past few years have been a bonanza for the oil corporations and their owners. ARC Corporations reports a Atremendous growth in equity capital infusions in the industry, which hit a record $11.8 billion in 2005." This has resulted in "an elevated level of 'unemployed' capital in the Canadian upstream oil and gas industry." Company managers are "having a difficult time deploying capital due to intense competition for land and services paired against a dearth of conventional opportunity."

The result of the recent high prices and low royalties and taxes is that the oil and gas industry has a very high return on equity (ROE). While the weighted cost of borrowing capital (WACC) in 2006 is around 4.5 percent, the ROE for the Canadian upstream oil and gas industry has risen from 15.4 percent in 2001 to 22.4 percent in 2005 (Terzakian and Baynton, 2006).

Royalties in Saskatchewan

As the provincial government stresses in their public relations pronouncements, Saskatchewan has many advantages for investors interested in the oil and gas industry. The "easy field access and relatively shallow deposits contribute to low drilling costs," bringing higher profits. There is easy transportation by pipeline to the United States, the major market. The Saskatchewan government has the most complete geological data and support system of any province in Canada. Government and universities provide significant research and expertise support. In addition, the province offers a wide range of incentives, including very low royalty rates. (Saskatchewan Industry and Resources, *Energy*, June 2006)

Royalties are a cost of production. They are the price that a private corporation must pay to acquire the use of a public asset. In Saskatchewan, as almost everywhere else in the world, natural resources are considered common public property. In most countries a high percentage of land has been privatized, primarily for farming, but it is normal practice for governments to retain mineral and subsurface

rights.

In the three prairie provinces some land and mineral rights were granted by the federal government before 1930, when control was passed to provincial governments. The most notable examples were the large land grants to the Canadian Pacific Railway and the Hudson's Bay Company. This comprises around 18 percent of the land in Saskatchewan today. The Crown holds 78 percent, with Indian reserves having two percent and federal land 1.5 percent. Those with "freehold rights" to land have traditionally paid a royalty to the government for oil and gas extraction, but this has been a lower rate than is charged on Crown land. Royalties take two forms: access royalties and production royalties.

Access royalties give corporations land tenure rights to minerals. In Saskatchewan Crown owned property is put up for bids six times a year. Private corporations approach the provincial Department of Industry and Resources and ask that a particular property that it wants to explore be posted for bids. After checking the land to see that it is free of constraints, it will be posted for bidding. The government uses different criteria to post special exploratory permits, exploration licenses, and leases. Companies can submit a standard bid for one tract of land or submit a priority bid that lists up to four parcels of land. The process for granting tenure rights is open competitive bidding.

Over the years the number of postings, the bids, the acreage covered and the total return to the province have varied. To a large extent this has been determined by the price of oil and gas, profitability of the industry, and the need of the oil corporations to restore their depleting reserves. Thus the number of hectares of land leased, and the return to the province as "bonus payments," peaked in 1994 but dropped significantly in 1998 with the Asian economic crisis and the decline in world oil prices. Listings began to pick up again with the dramatic increase in the price of oil and gas beginning in 2002.

Crown Land Sales in Saskatchewan

Year	Hectares	Total Sales C$
2005	483,605	134,414,243
2004	434,228	80,775,962
2003	1,064,439	158,744,313
2002	653,010	102,914,539
2001	372,648	56,208,097
2000	283,173	48,334,367
1999	398,240	45,672,311
1998	403,055	54,029,388
1997	933,862	131,001,623
1996	1,046,244	122,194,584
1995	604,232	65,678,769
1994	1,557,112	199,742,266
1993	595,481	83,676,494

SOURCE: Saskatchewan Industry and Resources, "Summary of Land Sale Results Per Calendar Year," June 2006.

Land sales and prices have risen through the first half of 2006. The average price per hectare was $376 in the June 2006 sale, up from the $175 average over the past five years. David Pryce of the Canadian Association of Petroleum Producers noted that this increase was directly related to the rising price of oil. He also pointed out that the price differential between light oil and heavy oil was narrowing. "We've gone from a $20 per barrel differential to somewhere between a $12 and $15 differential." This has resulted in increased bids in the Lloydminister area, the key centre of heavy oil. (*Leader-Post*, June 16, 2006)

The system of production royalties in Saskatchewan is quite complicated. The general trend since the NDP government of Allan Blakeney (1971-82) has been a steady reduction in the rate of the royalties and a reduction of the share of the value of oil and gas rent (or excess profits) that has gone to the government. These changes have been the result of regular negotiations between the oil and gas industry and the Saskatchewan government. This process has always excluded the public or any public input.

During the period when the Saskatchewan government was increasing royalty rates and claiming a growing share of rent (1971-1985) the rate of royalties in Saskatchewan was always higher than the average rate in Alberta. However, this did not result in capital flight to Alberta. Over the period from 1986 to the present, the drop in royalty rates in

Saskatchewan has paralleled the decline in royalty rates in Alberta. (Weir, 2002)

The royalty structure in Saskatchewan is anything but uniform. First, oil deposits are consigned to three categories: Heavy Oil (HOP), which is concentrated in the Lloydminister-Kindersley areas; Southwest Designated Oil (SOP), which is primarily medium crude oil; and Non-Heavy Oil Other Than Southwest Designated Oil (NOP), primarily from the southeast area around Weyburn and Estevan. These three basic categories are assigned different royalty rates.

Secondly, there are different rates of royalties assessed according to when oil wells were drilled. "Old oil," the best oil as it is primarily light crude, has been disappearing. It is still assigned the highest royalty rate. In January 1994 Roy Romanow's NDP government created a new category called "new oil," with a lower royalty rate, which now covers oil from wells developed between January 1, 1994 and October 1, 2002. The 1994 changes by the NDP government created an additional category, "third tier oil," with an even lower royalty rate, oil produced from vertical wells or oil extracted from water flood wells after this date.

A new "fourth tier oil" was introduced for conventional oil produced from wells that were developed after October 1, 2002. The fourth tier rate is very low. The industry is now granted large volume incentives for new wells, where no royalties are paid on base production for each well. For example, after October 1, 2002 new deep vertical oil wells receive an 8,000 cubic metre volume incentive, exploratory non-deep vertical oil wells are granted a 4,000 cubic metre volume incentive, and vertical deep oil wells are granted a 16,000 cubic metre volume incentive. A corporation pays no royalties on oil extracted from a well until it has produced the incentive volume. All of these changes were complicated methods for reducing royalties, or as the government insists, offering "incentives" to encourage expanded extraction. (Saskatchewan Industry and Resources, PR-IC01 to PR-IC03, accessed at www.ir.gov.sk.ca)

Then in March 2005 the NDP government introduced another lower royalty and tax regime, plus other incentives, designed to encourage the development of oil sands projects and enhanced oil recovery (EOR). Royalties assessed for freehold oil were significantly reduced, to between 0 percent and 8 percent. (Saskatchewan Industry and Resources, PR-IC11, March 21, 2005, accessed at www.ir.gov.sk.ca)

The province has a method of acquiring some additional revenues when production and prices increase. On a monthly basis the Ministry of Industry and Resources calculates a formula based on the average market price for each category of oil. Through this process they create a *base rate* and a *marginal rate* for each category. They are as follows:

Saskatchewan Royalty Rates for Oil

Category	Base Rate	Marginal Rate
Fourth tier oil	5.0%	30%
HOP, third tier or new oil	10.0%	25%
SOP, third tier or new oil	12.5%	35%
NOP, third tier or new oil	15.0%	35%
Old oil	20.0%	45%

SOURCE: Saskatchewan Industry and Resources, at www.ir.gov.sk.ca

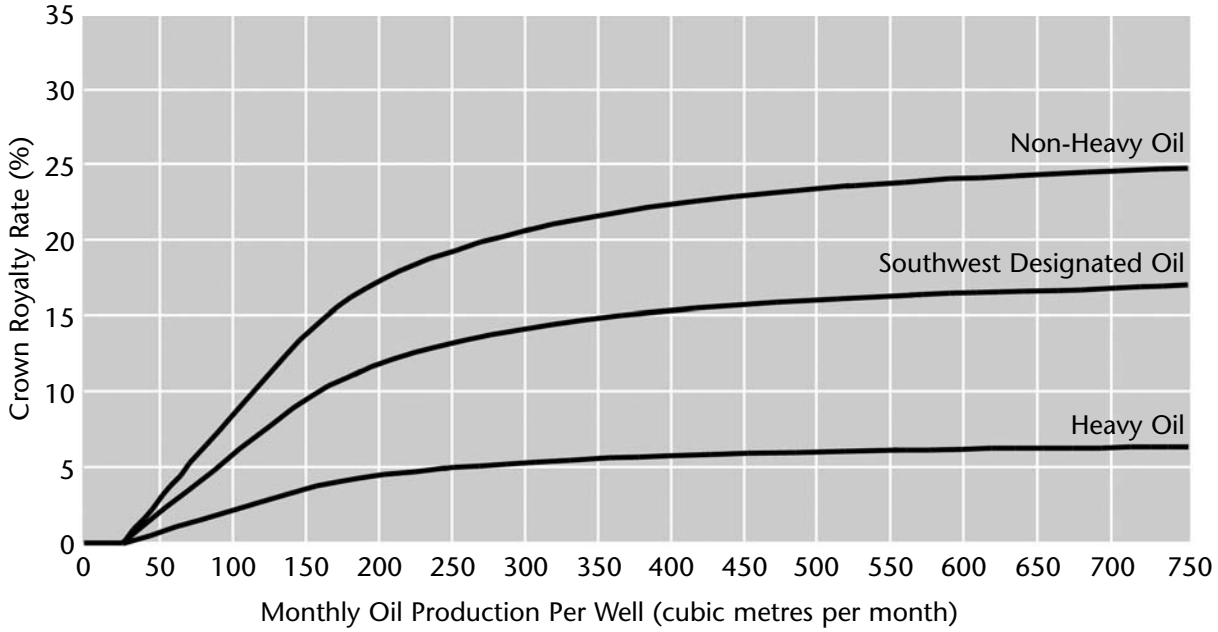
The department also calculates a *base price* on a monthly basis for all the categories of oil. If the actual average market price of the designated oil is above the base price, then the higher marginal rate is applied to the amount that exceeds the base price. The total royalties paid are thus a combination of the base rate and the marginal rate, and revenues will increase as the market price increases. This practice is widespread throughout the oil producing world, but most countries have a significantly higher marginal rate.

While this looks good at first glance, the province has adopted regulations that greatly reduce the share of this rent that goes to the province. The province has a *reference rate* for oil wells. This is set at 100 cubic metres (or 630 barrels) of oil per month. As we can see from the Crown Royalty Curve below established by the Ministry, the royalty rates at the reference rate of 100 cubic metres per month are all below 10 percent. As a well produces more oil per month, the rates rise rather slowly to maximum rates that are very low compared to those of other major oil producing countries. To put this in perspective, the Canadian Energy Research Institute reports that across the Western Canada Sedimentary Basin the oil production from an average conventional oil well has dropped to around 18 barrels per day or 540 barrels per month. This reflects the average production of oil wells in Saskatchewan. That would work out to

an average of 86 cubic metres per month, below the reference rate of 100 cubic metres per month. The average actual royalty rate would thus be less than six percent. Furthermore, these royalty rates are only applied after the well has produced the "incentive volume". (Canadian Energy Research Institute, 2005; Lerner, 2006)

of Petroleum Producers agreed. This new policy was supported by the leaders of the Saskatchewan Party and the Liberal Party. (*Leader-Post*, March 19, 2005)

Saskatchewan Crown Royalty Rates for Crude Produced from Wells Drilled on or after October 1, 2002 (December 2004 Production Month)



NOTE: Royalty curves are applicable only after the well has produced its incentive volume. Depending on the type of well, incentive volumes range from 0 to 16,000 cubic metres.

The decision of the NDP governments of Roy Romanow and Lorne Calvert to introduce new "third tier" and "fourth tier" rates has meant a major shift in the royalty rate away from the higher marginal rate to the lower base rate. As the wells producing "old oil" and "new oil" play out, the province will receive a declining percentage of economic rent from oil extraction. The new enhanced oil recovery (EOR) rates and incentives introduced by the Calvert government in March 2005 went even further. The premier argued that by not giving more breaks to the oil corporations, "we are literally foregoing billions of dollars of economic potential." It would be "better to take a smaller cut than to leave everything in the ground and receive nothing." Apache Canada Ltd., which operates an EOR project near Estevan, and the Canadian Association

VII. The Natural Gas Industry

Natural gas is a fossil fuel that is composed almost entirely of methane gas. When extracted from underground reservoirs it often contains other hydrocarbons including propane, butane, ethane and pentane. It is also known to contain sulphur, in the form of hydrogen sulphide, that is very toxic. In general, the Saskatchewan natural gas extracted by drilling wells is relatively "dry" meaning it has a low content of the liquid hydrocarbons and is "sweet" meaning that it is relatively low in sulphur. Most of the conventional wells are relatively shallow (e.g., 300 to 800 metres). Thus the natural gas present in Saskatchewan requires less processing and is more profitable for the corporations doing the extracting.

The first well was drilled in 1943, but production was rather slow to develop. It was not until 1987 that production equalled Saskatchewan's annual consumption, about 3.1 billion cubic metres (or 109.5 billion cubic feet). The expansion of the industry required the general shift from coal to natural gas to heat homes and buildings. A number of large industries in the province have been major consumers of natural gas, including the Co-op Upgrader, the Millar Western pulp mill, the Weyerhaeuser paper mill, the Saskferco fertilizer plant and the Husky Lloydminister Upgrader. Most of the gas wells are located in the west side of the province, close to the major fields that are in Alberta.

North American gas production

Conventional natural gas production peaked in the United States around 1973, just two years after the peak in the production of oil. The decline in the production of conventional gas was masked for a number of years by the increase in the production of gas from offshore areas. There was an increase in gas production after 1984, but this has all been accounted for by the development of methane gas from coal, also known as coal-bed methane (CBM), which is an unconventional source. While the number of wells drilled has continued to increase, the volume of reserves has steadily declined. US reserves in 2003 were 40 percent below the reserves of 1990. To make up for the shortfall, imports from Canada have risen. Nevertheless, despite the steady increase in the number of gas wells drilled in both the United States and Canada, North American gas production has been flat since 1997. (Simmons, 2006; Stark, 2005)

The gas industry in the United States has been on a "production treadmill" since 1973. This term, coined by Matt Simmons, a well known energy investment banker in Texas, describes a situation where more wells have to be drilled every year just to try to maintain a flat production rate. The amount of gas coming from new wells starts to steadily decline. The major producing areas in the United States - Oklahoma, Texas, and the Louisiana drilling in the Gulf of Mexico - have all peaked, and new wells are providing less and less gas. Between 1995 and 2000 the United States added 34,000 wells but production did not increase. A new well now has a first year decline of around 56 percent, which is a dramatic change from the past. Tight sand gas wells, where the flow of gas is much slower and more drilling is required, deplete by 50 percent in the first six months. (Darley, 2004; Duffin, 2004; Powers, 2003; Udall, 2000)

The proven reserves in the United States are only around eight years' supply at the current rate of consumption, which is over 22 trillion cubic feet (tcf) per year. The US Department of Energy projects that US demand will increase by 50 percent over the next 20 years. However, total natural gas production in the United States, Canada and Mexico declined by three percent in 2003 and three percent in 2004. The future hope for natural gas has been Alaska, but it has only 10 tcf of proven reserves, less than half a year's annual consumption. (Duffin, 2004; Gaul, 2004)

The lack of supply in the United States has

stimulated the natural gas industry in Canada. In 2004 over 50 percent of Canadian natural gas production was exported to the United States, supplying 15 percent of US consumption and accounting for 87 percent of US natural gas imports. The number of natural gas wells being drilled in Canada has been rising rapidly, from less than 2,000 in 1992 to around 15,100 in 2003. Gas production increased in Western Canada with the development of the large Ladyfern field in British Columbia; in 1999, its first year of production, the field produced 665 million cubic feet per day (the industry uses the abbreviation MMcf/d), but by 2003 this had dropped to 120 MMcf/d.

Canada's extraction of natural gas peaked in 2001 and declined by 5.3 percent in 2003. Furthermore, as the National Energy Board reports, the general trend in Western Canada is for lower initial productivity from new wells. The average initial production from gas wells has fallen from 1.0 MMcf/d in the early 1990s to 350 Mcf/d in 2004. Canada is also on the treadmill. By 2003 over 3.5 Bcf/d of new production capacity had to be developed just to offset the growing decline in well production. (Eynon, 2005; Flint and Dixon, 2004; National Energy Board, 2003, 2004; Stringham, 2004)

The National Energy Board (2003) has calculated the rate of decline of conventional natural gas production in the Western Canada Sedimentary Basin and made projections according to the trends. At the end of 2004 there were 104,000 producing natural gas wells:

2004	462 million cubic metres per day (16.3 Bcf/d)
2005	369 million cubic metres per day (13.0 Bcf/d)
2006	310 million cubic metres per day (11.0 Bcf/d)
2007	266 million cubic metres per day (9.4 Bcf/d)

The US Federal Energy Information Agency concludes that a "natural gas crisis" started around June 2000. Between this date and November 2003 natural gas prices in the United States rose by 83 percent. In June 2000 the average price was around US$3 for a thousand cubic feet (Mcf) and rose to over US$6 Mcf in 2004. By January 2005 it was over US$7 Mcf and expected to average over US$8 Mcf for the year. The Canadian Energy Research Institute estimates that natural gas prices in Canada will triple over the next 13 years due to the demands of the Alberta tar sands extraction process, to say nothing of increased US demand. The National Energy Board argues that the bright spot in all this is that while there are the "escalating costs" of drilling, operations, land and materials, "thus far, increases in gas prices have more than offset these higher costs." (Gaul, 2004; National Energy Board, 2003; Yedlin, 2005) (Industry figures are often measured as British thermal units, where one million British thermal units [1MMBtu] is equal to about 975 cubic feet of natural gas.)

The most recent assessment of the industry offers a slightly different picture. Natural Resources Canada argues that total natural gas production will not peak until 2011 at 6.6 trillion cubic feet (Tcf) and then decline to 5.3 Tcf by 2020. They expect greater production from coal bed methane gas and the introduction of natural gas from the Mackenzie Delta, but it will not make up for the decline from conventional sources. They expect Canadian demand for natural gas to rise from 2.7 Tcf in 2005 to 3.9 Tcf by 2020. The decline in production and the increase in Canadian demand can only be met by a major reduction in exports to the United States, from 3.7 Tcf in 2005 to 1.3 Tcf in 2020. (Natural Resources Canada, 2006)

New sources of natural gas

As a result of the depletion of natural gas from conventional and offshore reserves, the United States has been forced to look for other sources of supply. There has been a shift to coal bed methane gas (CBM) being developed in Wyoming, Montana, Colorado and New Mexico. This source now provides around 10 percent of US demand. However, it is an expensive process, requiring many more wells to extract the gas, and causes serious environmental problems. US reserves of CBM are estimated at 18 tcf, less than one year of annual consumption. (Darley, 2004; Udall, 2000)

The National Energy Board is predicting that in the WCSB the production of natural gas from coal will rise from 8 million cubic metres per day (0.3 Bcf/d) in 2005 to 25 million cubic metres per day (0.9 Bdf/d) by 2007. The two main sources are Horseshoe Canyon and the Mannville sites in the Alberta foothills. Horseshoe coal deposits are shallow and dry. In contrast, the Manneville coals, the larger resource, are deeper and contain extensive

quantities of saline water. In 2005 around 3,100 new wells were drilled in the Horseshoe Canyon area. (National Energy Board, October 2005)

There are significant problems associated with extraction of methane gas from coal deposits. First, the gas is "tight" which means that many more wells have to be drilled to extract the gas. Drilling costs are higher, and the industry argues that a price of $6/Mcf is required to make a profit. Normally, provincial regulation limits companies to drilling one well per section (640 acres). In the Powder Basin field in Wyoming, EnCana Corporation is limited to one well per 40 acres. They are pushing for one well for every ten acres, arguing that the additional wells are necessary for extracting the gas before it depletes. In Alberta the oil and gas companies are asking for the right to drill a well on every five acres. The land cleared and used for drilling a well (the well pad) is around four acres; thus the "ecological footprint" for CBM gas is very large.

Extraction of natural gas from coal requires "fracturing", the breaking up of the coal deposits by the pressure injection of air, water, sand and a variety of chemicals. The injections also include chemical gelling agents that improve the fracturing and ability to transport the gas.

Where the coal beds contain saline water, it is necessary to drain off the water before the fracturing process can begin. This has been a serious environmental problem in the Powder River Basin in Wyoming and Montana, and it will be a problem at the Mannville site in Alberta. In the United States there is fierce opposition from ranchers, farmers and rural residents, who insist that their ground water sources, and wells, are being polluted by the extraction process. A high percentage of the gelling chemicals are not retrieved in the extraction process. Opposition is also building in Alberta among rural residents, even in the Horseshoe Canyon area. Residents insist that the water in their wells is being contaminated by the drilling and extraction process. (Duckworth, 2005; Griffiths and Severson-Baker, 2003; Lorenz, 2005; Natural Resources Defence Council, 2002; Nikiforuk, 2006; Saskatchewan Industry and Resources, May 9, 2006)

The other major source of future gas for the US market is projected to come from the importation of liquefied natural gas (LNG). The US Energy Information Administration expects that by 2010 the United States will be importing 2.2 Tcf of LNG every year. Imports of conventional natural gas from Canada are expected to remain near the present level until 2010 when they are projecting a major decline. This shortfall can only be replaced by a dramatic increase in LNG imports. Imports of natural gas from Canada will decline at a slower pace if the resources in the Arctic are exploited and exported. (US Energy Information Administration, December 2003)

Most of the LNG will come from areas that are "stranded," far from major markets and not served by pipelines. The US Department of Energy argues that when a source of natural gas is more than 2,000 kilometres from a market, it is cheaper to supply the market by an LNG train than a pipeline. The LNG trains include pipelines to the exporting port, a liquification plant, special tanker ships, an importing port with a regasification plant, and pipelines to markets.

The world's major remaining natural gas reserves are concentrated: Russia (30.5%), Iran (14.8%), Qatar (9.2%), and Saudi Arabia (4.1%). The primary consumers of the world trade in LNG are Japan (68%), South Korea (25%), France (4%), Taiwan (3%) and the United Kingdom (3%). U. S. imports account for around one percent of the LNG market, mostly from Trinidad and Tobago. Cambridge Energy Research Associates project a major expansion of LNG imports for the United States and argue that the price will be lower than higher cost unconventional North American supplies. They expect both the United States and Canada to increasingly rely on LNG, up to 10Bcf/d by 2010. In March 2006 the price of natural gas in North America was around $7 per million BTUs (roughly the same as one thousand cubic feet). The industry argued that within the existing LNG trains it was able to make a profit when prices were $5 per million BTUs. (CERA, September 14, 2005 at www.cera.com; *Globe and Mail*, March 14, 2006; US Energy Information Agency, December 2003)

At present there are obstacles to a major expansion of this new source. There is a shortage of the special ships used to transport liquefied natural gas, a limited capacity for building them, and they are expensive. At the overseas natural gas sources, the liquefaction terminals and pipelines must be built. The United States (using Mexico and Canada as well) is planning to build a string of regasification terminals. The capital costs for an LNG terminal are close to $5 billion. The gas-to-liquid (GTL) terminal being considered for possible natural gas extraction on Melville Island in the Canadian Arctic is projected to cost $6.3 billion. Each of these liquid natural

gas trains can cost as much as $10 billion. (Chan, 2005)

Furthermore, the process of freezing and compressing gas for transport in special ships is dangerous and accidents happen. In January 2004 there was an explosion at an LNG terminal in Skikda, Algeria, which destroyed three of the six operations. Many people were killed and injured in these explosions, and the resulting fires did enormous damage. Thus in the United States local popular coalitions have fought and defeated proposals to build terminals in California and Alabama, so more have been planned for Mexico. Four are now planned for Canada: Port Tupper, N.S. (US Venture Energy /France), St. John, N.B. (Irving Oil and Repsol YPF/Spain), Goldsboro, N.S. (Maple LNG/ Netherlands and Suntera/Russia) and Gros-Cacouna, Quebec (PetroCanada and Gazprom/ Russia). All these projects were expecting to import LNG from Russia. However, in October 2006 the Russian government announced that Gazprom was not going to build LNG terminals but would instead concentrate on exporting natural gas to Europe through pipelines. (Darley, 2004; Duffin, 2004; Eynon, 2005; Gaul, 2004; *Globe and Mail*, July 11, 2006; October 10, 2006)

Canadian natural gas production

The demand for natural gas continues to rise. In the United States many new gas-fired power plants are coming on line. The share of Canadian gas going to the United States continues to rise. Can Canada fill the US demand? The Canadian Association of Petroleum Producers presents the optimistic view of future natural gas sources. The Mackenzie Delta will provide 64 Tcf. The Arctic Islands have a potential for 94 Tcf. The NWT and the Yukon could produce 17 Tcf. Drilling offshore in British Columbia could produce 35 Tcf. The offshore gas drilling in the Atlantic area has been very expensive and very disappointing, but it is believed to have a future potential. Coal bed methane gas in the Canadian Rockies could produce up to 80 Tcf. The industry argues that if these potential sources are not developed, natural gas production in Canada will seriously begin to decline around 2010. (Stringham, 2004)

To date almost all of the natural gas extracted and consumed in Canada or exported to the United States has come from the Western Canada Sedimentary Basin (WCSB). The National Energy Board has estimated the natural gas discovered and what might expect to be discovered:

Natural Gas Reserves

Western Canadian Sedimentary Basin	Discovered	Undiscovered	Ultimate Potential
Alberta	145	61	207
British Columbia	23	27	51
Saskatchewan	8	1	9
Southern Territories	1	6	7
Total	178	96	274

SOURCE: National Energy Board, April 2004.
Figures in trillion cubic feet (Tcf).

The total potential for the rest of Canada includes the East Coast (offshore) 91 Tcf, West Coast 17 Tcf, and Northern Canada 116 Tcf for an overall potential total of 501 Tcf. In this picture of actual discovered resources and those estimated, Saskatchewan represents a very small part. However, natural gas is extremely important, for the province depends almost entirely on natural gas for home and business heating. (National Energy Board, 2004)

Proven or proved reserves (abbreviated by the industry as 1P) is another matter. These are reserves that by geological data and technology are commercially recoverable under current economic conditions and regulations. In 2003 the Canadian Association of Petroleum Producers noted that these reserves for the WCSB peaked in 1984 and have been declining since. Gas reserves were estimated to be 56.6 Tcf, down 2.5 Tcf from 2002. In Saskatchewan the government estimated the province's natural gas reserves at 83 billion cubic metres (2.9 Tcf) in 1995, which declined to 76.8 billion cubic metres (2.7 Tcf) in 2002. (Saskatchewan Department of Industry and Resources, *Annual Report*, 2003; *Leader-Post*, November 26, 2004)

Natural Resources Canada projects that natural gas production in Saskatchewan will peak in 2005 at around 261 billion cubic feet (Bcf) per year to 70 Bcf by the year 2020. This is a dramatic drop in production and a cause for alarm, given the very cold

climate and the dependence on natural gas for heating. There is no indication that SaskEnergy or the provincial government are making plans to deal with this problem. (Natural Resources Canada, 2006)

Saskatchewan gas production and royalties

As natural gas discovery and extraction has declined in the United States and Alberta, drilling has increased in Saskatchewan, most dramatically in recent years. In 2000 there were 1209 gas wells drilled, and this rose to 2314 in 2003, dropping off to 1938 in 2004. The volume of gas extracted and sold has also risen rapidly since the mid-1980s and exceeded 9 billion cubic metres (318 Bcf) in 2003.

Historically, SaskPower, a provincial Crown Corporation, controlled natural gas within the province. It had the responsibility of providing gas to all customers. It progressively extended natural gas pipelines across the province. It actively participated in the upstream market, bidding on properties, obtaining leases and hiring service companies to develop fields. Storage facilities were created. SaskPower owned and controlled large natural gas fields in Alberta. The goal was to provide a secure source of natural gas for all Saskatchewan for some years into the future. In the mid-1980s it held ownership to gas that would have supplied the province's needs for fifteen years. In this period public utilities were considered to be a "natural monopoly" and it was more practical and more efficient to have the services delivered by a regulated government monopoly than a private profit-oriented monopoly. Following a similar path, the Alberta Energy Conservation Board originally mandated that the oil and gas industry retain a 30 year proven supply for the people of that province before any could be exported.

However, this commitment to service and security of supply changed. President Ronald Reagan's administration in the United States began to push hard for deregulation and privatization, including the electricity and natural gas industries. US administrations also strongly supported a continental energy agreement between the United States and Canada. The door was opened with the election of Brian Mulroney's Progressive Conservative government in 1984.

On October 31, 1985 the federal government and the governments of Alberta, British Columbia and Saskatchewan agreed to deregulate the natural gas industry. No longer would the provinces try to regulate the price of natural gas. It was hoped that buyers and sellers in Canada would set a market price. This followed similar developments in the United States.

The main purpose, however, was to help promote exports to the United States, reduce government involvement in the industry, and promote private corporate ownership and control. The public was told that deregulation and privatization would provide increased efficiency, choice for customers, greater security of supply, and reduced costs. In 1988 the Mulroney government signed the Canada-US Free Trade Agreement that created a continental energy market and gave the United States guaranteed access to Canada's oil and gas. (Banks, 2005; Cohen, 2002; Goodale, 1999; WillowBridge, 2001)

In 1988 the provincial Conservative government of Grant Devine split off the natural gas operation from SaskPower, creating SaskEnergy, expecting that it would be privatized. This has not happened yet, but subsequent NDP governments did not rejoin SaskEnergy with SaskPower. The conservative, pro-business politicians in North America pushed to "unbundle" public utilities. SaskEnergy's transmission pipelines were broken off into a separate company, TransGas, which has remained a subsidiary. But it was also set up to be privatized. SaskEnergy would no longer be in the business of securing supply; it would buy all its natural gas from private extracting companies on the open market.

Further deregulation took place under NDP governments. In November 1998 the NDP abolished SaskEnergy's monopoly on selling gas. Customers could now buy from any supplier. The major high-volume industrial customers signed separate contracts and got favourable prices. Home owners and small businesses were left to pay higher prices. SaskEnergy was no longer able to average rates across the province to provide a subsidy to people living in rural and remote areas.

In the late 1990s new natural gas pipelines were completed allowing a major increase in the export of natural gas to the United States. At the same time, peak oil and gas reduced the supply in North America. As SaskEnergy has pointed out, the rise in price of natural gas in western Canada generally followed these developments. In the 1993-8 period the average price of natural gas at Alberta Hub AECO

was $1.70/gigajoule (GJ). It rose to $4.35/GJ in the period 1999-2002 as the natural gas pipelines to the United States were completed and demand increased with new US gas-fired generation plants. As the peak in North American natural gas production was realized in 2003-2005, the average price rose to $6.40/GJ. SaskEnergy no longer has the ability to protect its customers from rapidly rising prices and high economic rent captured by private oil and gas corporations. (SaskEnergy measures natural gas in joules, an energy unit.) (SaskEnergy, 2005)

Today corporations extracting natural gas in Saskatchewan do not have to sell to SaskEnergy. In 2002 about 8.3 Bcf of natural gas was extracted and sold, and only 27.3 percent went to SaskEnergy. The remainder went to marketers and brokers (47.7 percent), direct sales to industrial and commercial users in the province (19.1 percent), and direct sales to consumers out of province (5.9 percent). Because it created the infrastructure, all the natural gas in Saskatchewan is transported by TransGas Ltd., a subsidiary of SaskEnergy. They are required to allow private natural gas companies to use their infrastructure for a nominal fee. Public infrastructure, created by all the people of Saskatchewan, is now used to help private companies maximize profits. (Saskatchewan Industry and Resources, January 2006)

Despite the overall trend of decline of supply, there have been some positive developments in Saskatchewan in recent years. The Shackleton area discovery north of Swift Current was the biggest find in 10 years. Hundreds of wells are now being drilled in this area. By 2003 it was estimated that this field accounted for around 20 percent of the province's reserves. TransGas has claimed that this new discovery reversed the treadmill and that new drilling is producing reserves that exceed the extraction rate. Royalties are increasing to the province as the volume of extraction increases and the price for natural gas is steadily rising. (*TransGas Link,* Issue 49, July 2004)

Nevertheless, conventional natural gas is disappearing in Saskatchewan. Wells in the province are only around one-fifth as productive as conventional natural gas wells in Alberta. Across the prairies regulations have traditionally limited drilling to one well per section of land (640 acres). However, with the increase in demand, the falling supply, and the excess profits being accumulated by the oil and gas corporations, drilling is on the increase. In the Hatton area in Southwest Saskatchewan the government now permits the drilling of up to eight wells per section. Some permits have allowed as many as 16 per section. (Lerner, 2006)

The relatively low cost of extracting conventional natural gas in the WCSB allows the industry to capture a very high level of economic rent (surplus profits), ranging from 27 percent to 53 percent of the market price. The following data from the US Energy Information Agency is based on financial data supplied by the large oil and gas corporations operating in western Canada:

Costs of Conventional Natural Gas in the Western Canada Sedimentary Basin
One thousand cubic feet ($US - Mcf)

Production costs:	
Finding and development	$0.80 - $1.50
Operations, General and Administration	$1.30
Royalties and taxes	$0.45
Range:	$2.55 - $3.25
Transportation:	$0.35 - $1.30
Delivered to Market:	$2.90 - $4.55
Market price (winter 2004)	$6.20
Economic rent	
Range:	$3.30 - $1.60
	53% - 27%

SOURCE: U.S. Department of Energy, Energy Information Administration, December 2004. Accessed at www.eia.doe.gov

This survey is a good representative sample of natural gas production in the WCSB. In 2003 the large oil and gas corporations surveyed by the US Department of Energy drilled 3,399 natural gas wells and reported having 41,586 producing wells. Direct lifting costs have steadily declined between 1985 and 2003 because of technological improvements. The success rate for new wells drilled has greatly increased over the years, again due to improved technology. The DOE notes that one of the major contributions to the decline in lifting costs was the "decline in both domestic and foreign production taxes [royalties]." (US Energy Information Administration, 2004)

Historically, royalties on the extraction of natural gas in Saskatchewan have been quite low. As a

percentage of sales, royalties were well under 10 percent until 1986. During the second term of Grant Devine's government (1987-91) the average return to the province was 13.1 percent. This fell to 12.6 percent during the first two terms of the current NDP government (1992-1999). The returns have risen to 14.6 percent during the third term of the NDP government (2000-3). As the data from the US Department of Energy reveals, the bulk of economic rent from natural gas extraction is going to the owners of the oil and gas corporations. (See Table II)

On a world wide basis Saskatchewan's royalties and fees from natural gas extraction are quite low. The trend in the major producing countries, like Russia, is to increase royalties. This trend is also true in the Americas, e.g. Bolivia. In 2003 a mass movement of Indigenous people, backed by the trade union movement, rose up and forced the President to resign. They strongly objected to a deal the government had made with large foreign oil and gas corporations to extract and ship their natural gas to the United States via LNG tankers. They rejected the "low royalty rate" of 18 percent included in the agreement and demanded 50 percent of the value of the sales of the gas. The Bolivian legislature, controlled by parties of the right, subsequently passed new legislation that nevertheless included the re-establishment of the partially privatized state owned oil and gas corporation (YPFB), required an independent financial audit of all oil and gas corporations operating in the country, proclaimed that natural gas was a national treasure for the benefit of all Bolivians and required that royalties be increased to 50 percent of sales.

At this point the US government and the 46 foreign oil and gas corporations intervened to put pressure on the new president, Carlos Mesa, and he refused to sign the legislation. In mid-March 2005 the broad opposition coalition took to the streets again and shut down all transportation. Mesa resigned, but the legislature refused to accept his resignation, insisting that he sign the legislation. An impasse was reached. In a special December 2005 general election, Evo Morales and the broad left won the Presidency and control of the legislature. In May 2006 the new populist government formally declared that the oil and gas resources are national assets, and royalties on natural gas would rise to 50 to 82 percent; in the two largest natural gas fields, the royalty rate would rise to 82 percent. Furthermore all corporations operating in the oil and gas industry would have to accept joint ventures where YPFB would hold 51 percent of the assets. Almost all of the large foreign corporations agreed to work with the government to make the necessary changes. (Ballve, 2005; "Chavez Lauds Bolivia's Offensive on Gas," *Globe and Mail*, May 5, 2006, B-8; Hester, 2006)

However, Canada is not Bolivia, Russia or Qatar. The political atmosphere here is different. The people of Saskatchewan have always received less than 18 percent of sales for their natural gas. From 1992 through 2003 the government of Saskatchewan received royalties and fees equivalent to 13.8 percent of sales of this non-renewable resource. Many countries get 50 percent or more. (Table II; Powers, 2003)

As with the oil industry, Saskatchewan governments have been steadily reducing the royalties on natural gas extraction. They have done this through various indirect methods that generally hide the changes from the general public. The royalty regime differentiates between gas wells according to the year they began producing, whether they were associated (combined with oil extraction) or non-associated wells, and whether they were exploratory or development wells. Wells developed on "freehold lands" have paid very low royalties. The government has also introduced "volume incentives", where initial volumes extracted from each well are exempted from the regular royalty rate. The overall result is that natural gas companies pay royalties that are significantly lower than those in Alberta or British Columbia.

Given the declining supply of natural gas, the steady increase in prices, and the large profits that the oil and gas corporations are making, it is surprising that the NDP government *lowered* the natural gas royalties in October 2002 creating a new "fourth tier" rate.

Then in March 2004 the Calvert government announced an even lower rate for "exploratory gas wells" where the rate is only 2.5 percent for wells on Crown land and 0 percent for wells on freehold land. Even this royalty is not applied until a well has produced 25 million cubic metres (883 MMcf), the "royalty/tax incentive volume". The current rates are summarized in the following table (see next page):

Natural Gas Royalty Rate Calculator

Classification		Non Associated Gas (%)	Associated Gas (%)
Fourth Tier	(2002 to present)	11.69	11.31
Third Tier	(1998 to 2002)	14.40	14.40
New Gas	(1976 to 2002)	16.75	16.75
Old Gas	(prior to 1976)	21.89	21.89

SOURCE: Saskatchewan Industry and Resources, June 2006. www.ir.gov.sk.ca

NOTE: These figures are based on the production level of an average well in Saskatchewan, between 100 and 120 thousand cubic metres per month.

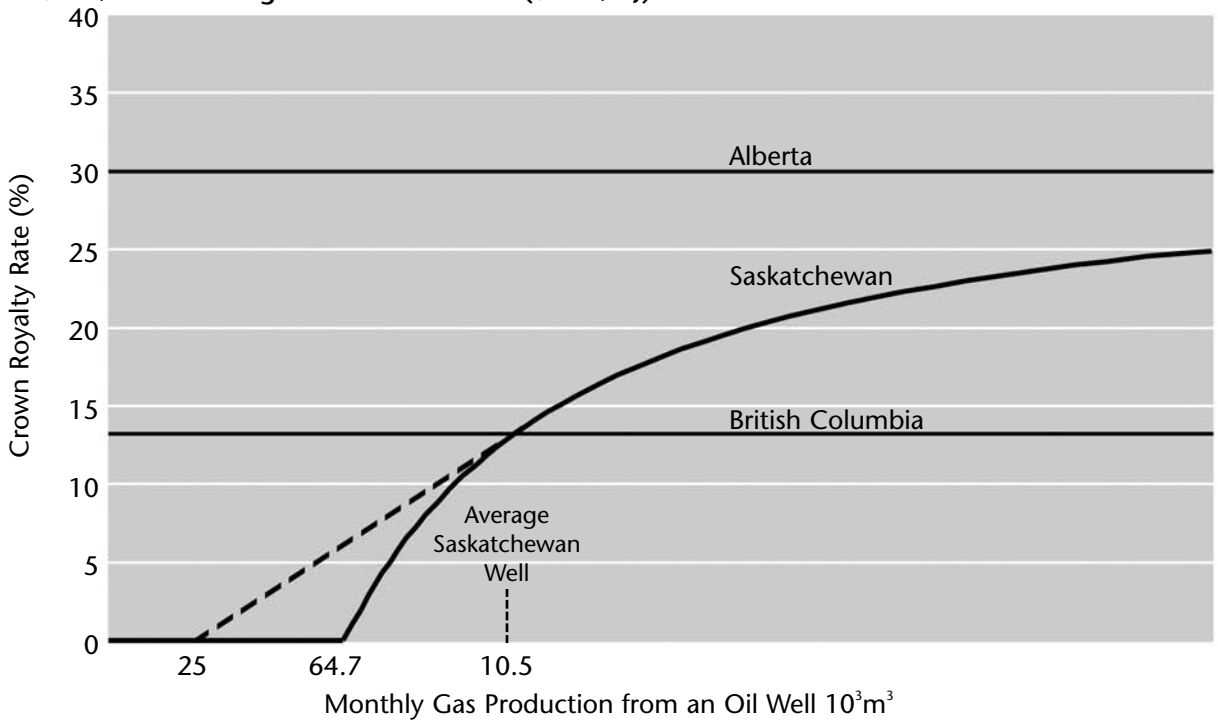
In reality, the royalty rate actually paid is considerably lower because of the existence of the volume incentives. Thus as the following figure for associated natural gas demonstrates, corporations do not pay any royalties until the incentive has been extracted. This is a major factor explaining why the royalties received by the people of Saskatchewan for the extraction of natural gas are lower than those collected in Alberta and British Columbia. (Alberta, 2003)

Royalties also include the bonus bids that a province receives for granting permits and leases. While land sales are going up, the return to the province is lower than elsewhere in the WCSB. In 2004 the average bonus bid return for British Columbia was $423 per ha, for Alberta, $343 per ha, and for Saskatchewan, $171 per ha. The provincial government identifies this as "The REAL Saskatchewan Advantage" on their web site. (Saskatchewan Industry and Resources, PR-IC04, March 2004 at www.ir.gov.sk.ca; Saskatchewan Industry and Resources, *Land Price Comparisons*, January 2005)

The people in Saskatchewan should be concerned about developments in the area of natural gas. Saskatchewan heavily depends on natural gas to heat homes and provide energy for business and industrial developments. Reserves are limited and are being rapidly depleted. The corporations extracting the natural gas have absolutely no loyalty to the people of the province and are exporting it to Eastern Canada and the United States as fast as

Associated Gas Royalty Structure

@ $200/10³m³ Average Natural Gas Price ($5.46/GJ)



SOURCE: Saskatchewan Industry and Resources, www.ir.gov.sk.ca

they can. Allowing for seasonal fluctuations, prices in general have been going up substantially every year. SaskEnergy seems to have no plan for the future. What will Saskatchewan do as the natural gas starts to run out, production starts to seriously decline, and prices start rising even more rapidly? This is not far off. Natural gas will be rationed according to ability to pay. The only program presently offered by SaskEnergy to deal with this looming crisis is a loan to homeowners to buy a more efficient natural gas furnace. The royalties that the people of Saskatchewan receive for the extraction of this valuable natural resource are among the lowest in the world. The provincial government and the opposition parties are silent on these issues. Saskatchewan's political leaders are committed to the "business as usual" approach.

VIII. Summary and Conclusion

In assessing Saskatchewan's oil and gas policy and proposing alternatives to the business as usual approach now in place it is necessary to remember the key aspects of the international political economy of the industry.

The oil industry has never been characterized by a free market. It has always been dominated by a small number of very large transnational corporations, working together as an oligopoly with strong support from governments. In 2004 Saudi Arabia drilled 373 oil wells; there were 40,824 drilled in the United States. The average US well in 2004 produced 11 barrels of oil per day; the average Saudi well produced 5,680 barrels per day. Without high prices supported by the industry and governments, there would be a very small oil industry in North America. (Lynch, 2006)

Oil has been the most important international commodity. As it is found primarily in the less developed areas of the world, the industry has been closely linked to colonialism, imperialism and domination by the countries and private corporations from the industrialized north. The United States maintains over 254,000 military personnel in 153 countries, excluding the armed forces in Iraq and Afghanistan There are also 725 acknowledged military bases in thirty-eight countries plus five aircraft carrier battle fleets. The overseas US military is strategically placed to protect access to sources of oil. (Johnson, 2004)

Oil is the crucial energy that supports the US world military system. US national security policy has always placed the highest priority on security of supply. At least from the earliest period of the Cold War, US political-military strategy has emphasized control of oil coming from the Middle East.

US policy in the Americas has been to control the oil and gas industries in Venezuela, Mexico and Canada. This has been done through close co-operation with the US oil industry and direct and indirect intervention in the internal affairs of the exporting countries.

The world is running out of conventional oil and gas supply, and there is far greater competition today for the remaining resources. The large private firms, which have historically dominated the industry, are excluded from much of the remaining major reserves. The less developed producing countries have been re-developing their national oil companies and are assuming greater political control over their natural resources. The United States and Europe are being challenged by China, India and Japan for control over the remaining oil and gas resources.

Climate change is a very serious problem and requires a major reduction in the burning of fossil fuels. Only a few small steps have been made to reach the UN Intergovernmental Panel on Climate Change's goal of a 70 percent reduction. With increasing demand for energy and greater competition for the remaining oil and gas reserves, few governments have been willing to take any action to hinder the development of the oil and gas industry.

The Canadian oil and gas industry has historically been dominated by large foreign-owned transnational corporations. There are now a number of large Canadian controlled corporations and oil and gas trusts, but they are increasingly coming under US share ownership. The industry as a whole strongly supports the present policy of extracting and selling oil and gas to the United States as fast as possible. They are strongly opposed to any governmental actions on climate change that would adversely affect their profits.

All the existing governments in Canada, and the major political parties, support the Canada US Free Trade Agreement, the North American Free Trade Agreement and the existence of a continental energy agreement. None oppose US guaranteed access to Canada's oil and gas resources. This follows the direction advocated by the organizations representing big business who see "deeper integration" with the United States.

The other major reality is the disappearance of

conventional oil and gas in the Western Canada Sedimentary Basin. Because of the extraction and shipping of these non-renewable resources to the United States, accelerated under the free trade agreements, the people of Saskatchewan face the reality of steadily increasing prices for oil and gas and a shortage of supply. No oil and gas is being held for future generations.

The business as usual approach to the development and consumption of oil and gas dominates the political elite in Saskatchewan. None of the major political parties oppose any of the general trends in the industry. The NDP government under Lorne Calvert has supported the call by President George W. Bush for a new continental energy agreement that would send even more energy to the United States. The Saskatchewan Party and the provincial Liberal Party agree. So do all of the major Saskatchewan business organizations.

Since 1982 provincial governments have steadily reduced the royalties and taxes paid by the oil and gas industry. All the major parties agree with this policy. Since 1997 all three political parties have opposed any mandatory regulations on the oil and gas industry that would force them to comply with the principal goals of the Kyoto Accord on greenhouse gas emissions.

However, this consensus among the political and business elite in Saskatchewan is not reflected in broader public opinion. Numerous public opinion polls show that Canadians want our governments to act on climate change. Public opinion supports conserving energy for our own use first and for future generations. A Leger Marketing poll in August 2005 found that 43 percent of Canadians would like to see the entire oil and gas industry nationalized. Only in Alberta did a majority oppose nationalization. (*Leader-Post*, September 6, 2005)

The NDP government of Allan Blakeney (1971-82) began implementing a democratic policy towards natural resource extraction. Natural resources are a free gift from nature, and democratic rent theory argues that the proceeds of their use should go to the population as a whole. Liberal rent theory was developed during the period of the rise of western European imperialism and colonialism when only men with property had a voice in government. The classic liberal rent theory held that the benefits from resource exploitation should go to individuals and corporations and not the public at large. This conflict over who should benefit from resource exploitation remains central to policy development.

Today in Saskatchewan the liberal theory of economic rent from resources is in command. An alternative policy would necessarily change priorities. A different government would have to decide to put the interests of the general population ahead of the interests of the owners of the oil and gas corporations. It would place a high priority on trying to provide security of supply for present and future generations. It would choose to try to maximize returns on the sale of these non renewable resources for the general population. A new approach would recognize the threat to Saskatchewan posed by greenhouse gas emissions, global warming and climate change. This would require a new provincial energy program that would include the serious development of our alternate energy potential. It would also recognize that to export more energy to the United States, where five percent of the world's population consumes 25 percent of the world's energy, is wrong. This policy helps the United States maintain its dominant military presence around the world. It also helps them avoid any responsibility for the catastrophe that awaits the world as it rushes to the "dangerous anthropogenic interference" (DAI) level where global warming begins to feed on itself and becomes irreversible.

What can be done? Here are a few suggestions. They are not radical. They involve a return to the policies that we have had in the not-too-distant past.

- Create a provincial energy conservation board to cover these industries. All sales would have to be made to this agency. This would be modeled after the Alberta Energy Conservation Board and marketing boards like Canpotex, which has controlled production and sales by the potash industry. The creation of such a board would allow government to control sales, prices, profits and resource rents. By setting a level of proven reserve to be held for the people of Saskatchewan (e.g., 30 years as in Alberta), exports to the United States would be cut back.
- Raise royalties up to the average level that they were during the government of Allan Blakeney, which was around 50 percent of sales. This is a common rate around the world today. Royalties on natural gas would also be raised so that most of the economic rent (excess profit) would go to the general public.

- Implement an excess profits tax. A number of countries around the world have implemented such a tax in the last few years. During the rapid increase in prices after 1973, the government of Saskatchewan introduced a "royalty surcharge" to capture some of the windfall profits going to the private corporations. In Alberta, Peter Lougheed's government abandoned the fixed royalty system so that the share captured by the government would rise with international prices. (See Richards and Pratt, 1979)
- Merge SaskEnergy with SaskPower and give it control over natural gas development and distribution within the province. The priority would be to conserve natural gas for the use of present and future generations. This would require phasing out exports to the United States.
- Re-establish the Saskatchewan Heritage Fund, allocate at least 50 percent of the royalties from the depletion of oil and gas to the Fund, and invest in renewable energy development. This program worked well in the past in Saskatchewan and works well today in Alaska and Norway.
- Re-create SaskOil as a Crown corporation with the goal of gaining ownership and control over the remaining provincial oil reserves. Revive the principles of the Saskatchewan Mining and Development Corporation Act, which would require all future developments to include the right of SaskOil to 50 percent ownership. This policy worked well for the uranium industry in Saskatchewan and has worked well in the oil industry in Norway.

There is a logical alternative to the present business as usual policy. Many people support this alternative. What is needed is a political movement that is committed to changing government policy. At one time that could be found in the Co-operative Commonwealth Federation (CCF) and the New Democratic Party (NDP). However, that is no longer the case. The past two NDP governments have been more committed to a policy of putting the interests of the owners of private corporations first than the Progressive Conservative government of Grant Devine.

ANNEX

Fiscal Regimes

Mexico. All the revenues from the exploitation of oil and gas go to the government following the nationalization of the industry in 1938. Development is limited to PEMEX, the state owned company that also has a monopoly over wholesale and retail distribution. This is the best example of the democratic rent regime, where all returns from the exploitation of a natural resource go to the people as a whole. (Laguna, 2004)

Venezuela. The oil and gas industry was originally nationalized in 1936 and PDVSA (its NOC) is one of the world's largest. The government of Hugo Chavez has re-asserted control over the industry and PVDSA. Production Sharing Agreements with IOCs have been transformed into joint ventures, where PVDSA holds a minimum of 60 percent equity. Royalties were increased from one to sixteen percent. Corporate taxes were raised from 34 to 50 percent. (www.venezuelanalysis.com, 2006)

Russia. While the immediate post-Soviet governments privatized almost all state assets, President Vladimir Putin's government has established OAO Rosneft as a major oil NOC and OAO Gazprom as the monopoly firm in the gas industry. A new Subsoil Law limits foreign ownership in this industry to less than 50 percent of any development project. Oil exports are subject to an excise tax of up to $27 per barrel depending on grade. The government now takes about 90 percent of the value of sales above $25 per barrel. (*Petroleum Intelligence Weekly*, various issues, 2005-6)

OPEC countries. All OPEC countries in the Middle East have NOCs. The private sector companies were nationalized in the 1970s. The industry is controlled by the NOCs and the central governments. All engage in joint ventures and production sharing agreements with IOCs. Exports are controlled by the government. All have term contracts that specify that when international oil prices increase, the share going to the government increases. Thus they are able to capture almost all of the increases in economic rent (excess profits) that come with the increase in international prices. (*Petroleum Intelligence Weekly*, various issues, 2005-6)

Saudi Arabia. Saudi Aramco is one of the largest oil corporations in the world, now a completely state owned enterprise. The government maintains complete control over the industry. Aramco develops its own fields, hires service companies, and engages in joint ventures with western IOCs. By controlling exports and prices through contracts, it captures most of economic rent. (*Petroleum Intelligence Weekly*, various issues, 2005-6)

China. While the Chinese government has privatized around 80 percent of the economy, it has maintained almost complete control over the energy sector, including development, sales, imports and pricing. It does permit joint ventures with IOCs. Its three major oil NOCs are among the world's largest, engaging in development projects around the world. To secure supply, China regularly provides exporting countries with a range of infrastructure and other solidarity programs. Chinese policy prefers joint ventures with other NOCs and government-to-government agreements. (*Globe and Mail*, May 2, 2006; Walton, 2005)

India. India is a major importer of oil and gas and a free market economy. Nevertheless, the state owned Oil and Natural Gas Corporation (ONGC) is one of the largest oil and gas corporations in the world, operates on a world-wide basis, and is a partner in joint ventures in India and elsewhere. Reliance Industries (RIL), an Indian-owned IOC, is a major world oil company. There are other smaller NOCs as well. India is known for having relatively low royalty rates, but the state controls retail prices, which limits profits. (*Petroleum Intelligence Weekly*, 2005-6; Kjemperud, 2004)

Indonesia. In OPEC member Indonesia the government controls the oil and gas industry through Pertamina, its NOC. Pertamina regularly engages in joint ventures and production sharing agreements with IOCs and aggressively operates around the world. The government imposes a higher profit tax on the petroleum industry. The royalty system requires that all companies pay a share of the oil extracted to the government; this is 6.7 percent when the price of a barrel of oil is below $45 and 13.5 percent when above. The industry has been hurt by the government, which has artificially held the price of products low to subsidize consumers. (*Petroleum Intelligence Weekly*, 2005-6)

Libya. Like all of the OPEC countries, Libya nationalized the oil industry in the early 1970s. Production fell during the US imposed boycott. However, this has lifted, and Moammar Gadhafi has opened up development to foreign corporations. The government has introduced a new system of production sharing, which accompanies bids for developing areas. In addition to the price of the bonus bid, companies also have to bid on the "X-factor", the share of the oil and gas extracted that will go to the Libyan National Oil Corporation. In the October 2005 bidding, 50 oil companies from 27 countries participated. The 17 winners agreed to provide LNOC with between 70 and 94 percent of their production. (*Petroleum Intelligence Weekly*, October 10, 2005)

Abu Dhabi - United Arab Emirates. The oil industry in this OPEC country is managed by its national oil company, Abu Dhabi National Oil Co. (ADNOC). It emphasizes joint ventures and production sharing agreements with the major oil corporations, both IOCs and NOCs. It imposes three different taxes on foreign oil corporations: a royalty of 20 percent, a corporation tax of 55 percent, and what is known as the "make-up tax." The latter limits the margin of the companies to $1 per barrel. This ensures that the bulk of the economic rent goes to the exporting country. (*Petroleum Intelligence Weekly*, May 1 and May 29, 2006)

Kazakhstan. One of the last large oil deposits in the world is around the Caspian Sea. In 2005 the government of Kazakhstan changed its rules on the oil and gas industries. All new development projects must provide for at least 50 percent ownership by state-owned Kazmuniagas (KMG). Furthermore, 80 percent of the oil will go to the state under new production sharing agreements. (*Petroleum Intelligence Weekly*, October 17, 2005)

Brazil. From its beginning in 1953 the oil industry has been under the control of Petrobras, the state-owned company. After 1995 private companies were permitted and private investors were allowed to purchase 45 percent of Petrobras stock. It has 11 refineries and dominates the wholesale and retail industries. It has become one of the strongest international oil companies, operating around the world, specializing in offshore oil and gas extraction. Through royalties and taxes, it is the largest contributor of revenues to the Brazilian government. (Palacios, 2002; P*etroleum Intelligence Weekly*, various issues, 2005-6)

Bolivia. In the past two years the Bolivian government has moved to increase control over the oil and gas industry. In 2005 basic royalty rates were raised to 32 percent. State-owned YPFB was revived and all of the private natural gas industry was nationalized. On May 1, 2006 the new government of Evo Morales decreed that 82 percent of all the revenues from natural gas in the two largest fields would now go to the government. The price of exported gas was raised by 40 percent. New production sharing agreements and joint ventures are being negotiated. (*Petroleum Intelligence Weekly*, various issues, 2005-6)

Ecuador. In 2005-6 the government moved to take greater control over the oil and gas industry. State-owned Petroecuador took over Occidental Petroleum's assets. An excess profits tax was imposed on company profits covering 2001-2005. A new hydrocarbon law grants the government 50 percent of all gross income where the international price of oil rises higher than a threshold level set by the state. (*Petroleum Intelligence Weekly*, various issues, 2005-6)

Norway. Government ownership in Statoil (84%) and Norsk Hydro (44%) provides a return to the public. The State Direct Financial Interest maintains equity positions in offshore developments. Other revenues are from the corporate tax, a special petroleum tax and various duties. There is also a carbon dioxide tax. Revenues are also paid into the Norwegian Government Petroleum Fund, a form of Heritage Fund. Royalties are reduced for corporations developing older fields where production is declining. (*Petroleum Intelligence Weekly*, various issues, 2005-6; Norwegian Finance Department, 2005)

Alaska. Alaska uses several fiscal tools to obtain revenues from private development of the oil and gas industry. First, there is a royalty of 12.5 percent on the value of production. In addition, there is a production tax (called a severance tax in the USA), which is 12.25 to 15 percent. There is a state income tax of 9.4 percent of net profits, and a state property tax of two percent. There is also the Alaska Permanent Fund and the Public School Fund, which accumulate a share of royalties and make investments. The APF pays an annual dividend to every Alaskan citizen. Numerous court actions against the oil corporations for tax evasion have resulted in payments that are put into the Constitution Budget Reserve Fund. The federal government shares royalties from offshore development with Alaska. (Alaska Finance at www.tax.state.ak.us)

Table I: Petroleum Production, Sales and Royalties

Year	Volume Produced (Cubic metres)	Value of Sales $C	Royalties $C	Royalties as a percent/sales
1972	13,767,993	213,780,984	27,953,000	13.1
1973	13,625,605	263,734.307	38,045,000	14.4
1974	11,725,945	396,675,848	50,519,400	12.6
1975	9,379,084	406,273,743	203.213,800	50.0
1976	8,888,577	443,698,639	196,178,900	44.2
1977	9,741,666	579,132,726	232,478,600	40.1
1978	9,624,550	689,316,965	293.953,000	42.6
1979	9,371,831	726,709,636	415,252,500	57.1
1980	9,330,839	862,401,640	468,973,500	54.4
1981	7,392,815	821,032,271	375,273,300	45.7
1982	8,103,947	1,189,368,427	774,840,400	65.1
1983	9,543,427	1,650,760,643	680,021,500	40.5
1984	10,812,499	1,867,839,459	730,878,800	39.1
1985	11,612,728	2,252,081,638	766,913,600	34.1
1986	11,698,239	1,173,895,539	261,471,900	22.3
1987	12,074,616	1,514,653,876	356,223,700	23.5
1988	12,269,110	1,044,243,396	207,807,800	19.9
1989	11,695,613	1,251,252,794	220.902,600	17.7
1990	12,253,452	1,627,112,509	280,353,000	17.2
1991	12,420,084	1,204,847,851	232,480,700	19.3
1992	13,369,511	1,422,593,036	232,052,800	16.3
1993	14,973,383	1,495,966,211	317,563,500	21.2
1994	17,203,619	1,900,047,745	463,873,800	24.4
1995	18,747,271	2,320,458,559	420,929,500	18.1
1996	20,935,843	3,139,575,577	598,362,100	19.1
1997	23,456,769	2,909,543,750	619,311,800	21.3
1998	23,154,231	1,980,356,363	305,725,000	15.4
1999	21,709,071	3,095,071,424	462,733,000	14.9
2000	24,245,040	5,078,410,022	826,439,800	16.3
2001	24,747,979	3,748,086,857	625,941,200	16.7
2002	24,415,468	4,715,064,265	682,555,100	14.5
2003	24,330,000	4,755,000,000	709,400,000	14.9

SOURCE: Saskatchewan Bureau of Statistics, *Mineral Statistics Yearbook 2002*. Regina, 2004. Saskatchewan Industry and Resources, *Annual Report*, 2003-4. Regina, 2004.

NOTE: Royalties includes royalties/production taxes, land bonus bids, lease rentals.

Table II: Natural Gas Production, Sales and Royalties

Year	Volume Produced (Thousand Cubic metres)	Value of Sales $C	Royalties $C	Royalties as a percent/sales
1972	1,657,002	7,219,640	410,170	5.7
1973	1,645,187	7,535,998	623,348	8.3
1974	1,507,692	7,730,420	805,342	10.4
1975	1,588,951	9,032,826	838,910	9.3
1976	1,530,871	10,666,729	849,751	8.0
1977	1,268,982	12,957,162	697,511	5.4
1978	1,189,035	16,882,426	693,389	4.1
1979	1,177,957	17,231,180	619,264	3.6
1980	1,196,895	19,628,096	678,359	3.5
1981	1,191,312	19,719,924	711,711	3.6
1982	1,272,434	24,257,490	714,801	2.9
1983	1,314,291	50,170,734	2,611,203	5.2
1984	1,744,178	88,589,999	7,157,163	8.1
1985	1,990,529	119,689,387	10,192,860	8.5
1986	2,367,995	170,445,630	19,264,442	11.3
1987	2,711,985	166,597,713	24,192,441	14.5
1988	3,991,768	206,956,329	26,760,206	12.9
1989	5,586,647	294,219,070	39,915,133	13.6
1990	6,318,503	359,616,942	43,264,939	12.0
1991	6,632,955	380,549,166	50,299,752	13.2
1992	6,790,428	349,548,768	32,586,899	9.3
1993	6,881,195	387,831,245	38,998,528	10.1
1994	7,891,892	528,412,324	69,331,321	13.1
1995	7,787,540	373,513,079	40,715,848	10.9
1996	8,071,000	354,000,000	53,000,000	14.9
1997	7,820,000	406,000,000	44,000,000	10.8
1998	7,696,000	435,000,000	65,900,000	15.1
1999	7,911,000	623,000,000	91,800,000	14.7
2000	8,152,000	1,128,000,000	239,300,000	21.2
2001	8,290,000	1,307,000,000	129,100,000	9.0
2002	8,278,000	942,000,000	152,700,000	16.2
2003	9,050,000	1,577,000,000	205,400,000	13.0

SOURCE: Saskatchewan Bureau of Statistics, *Mineral Statistics Yearbook 2002*. Regina, 2004.
Saskatchewan Industry and Resources, *Annual Report*, 2003-4. Regina, 2004.

Common Measurements and Conversions

Natural gas:

Mcf = thousand cubic feet
MMcf = million cubic feet
Tcf = trillion cubic feet
MMBtu = million Btu or British Thermal Units
= around 975 cubic feet of natural gas
1 cubic metre = 35.315 cubic feet of natural gas

Crude oil:

bbl = barrels
b/d = barrels per day
Mb/d = thousand barrels per day
1 cubic metre = 6.292 barrels
1 barrel = 34.92 imperial gallons
1 barrel = 0.15889 cubic metre
1 barrel = 0.136 tonne

Barrel of oil equivalent (BOE):

1 barrel of oil = 6 thousand cubic feet of natural gas

Energy units:

1 gigajoule (GJ) = one billion joules
1 gigajoule = 0.95 million Btu
1 gigajoule = 0.95 thousand cubic feet of natural gas
1 gigajoule = 165 barrels of oil
1 thousand cubic feet of natural gas = 1.05 gigajoules
1 cubic metre of light crude oil = 38.51 gigajoules

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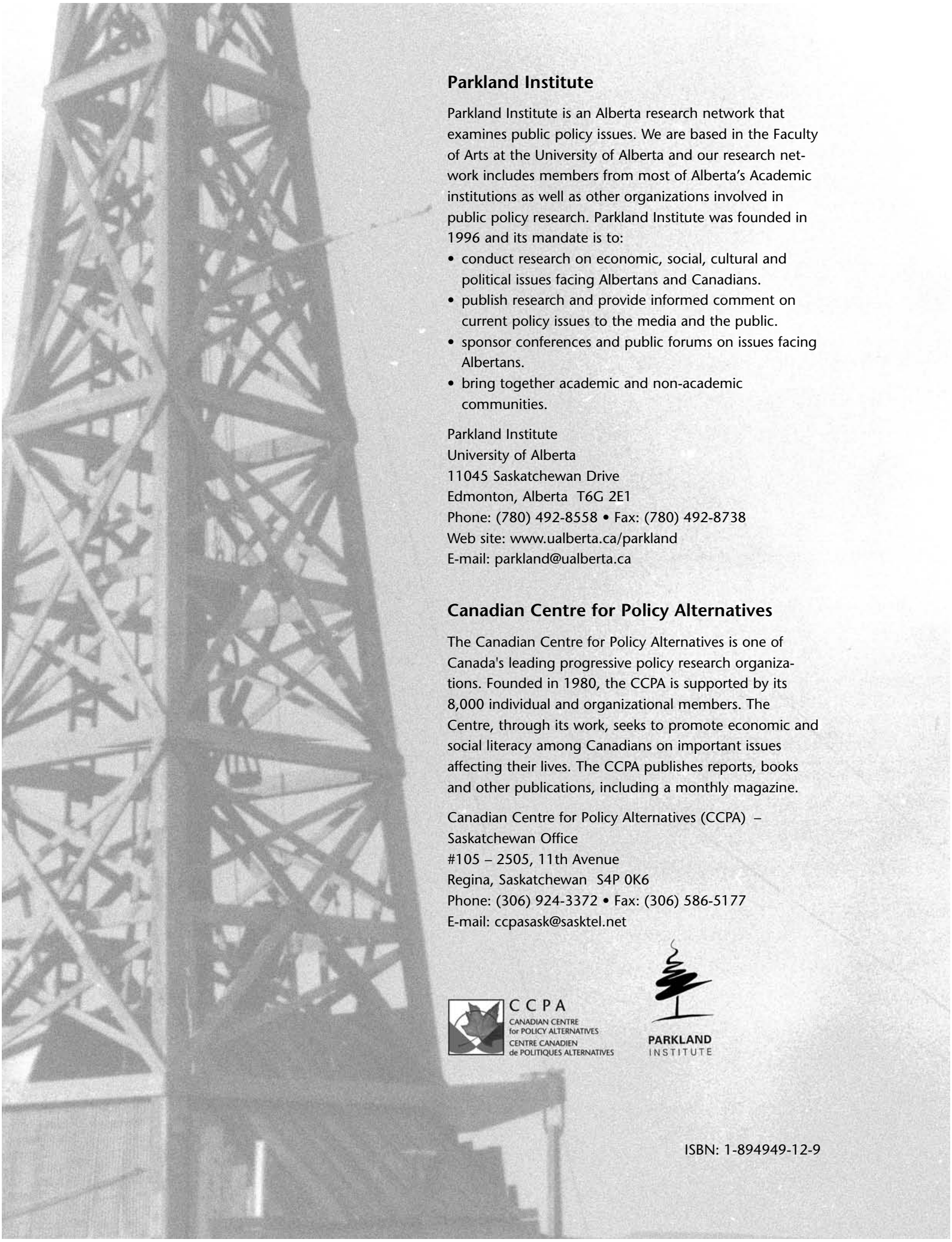

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ISBN: 1-894949-12-9