



Unifor Energy Policy

A Progressive Vision for Canada's Energy Future

Produced by:
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Table of Contents

i.	List of Abbreviations	iii
ii.	List of Tables.....	iv
iii.	List of Figures	iv
iv.	Executive Summary	1
	Unifor’s Vision for a Canadian Energy Policy	3
1.	History of Canadian Energy Development and Energy Policy	4
1.1	A Brief History of Canadian Energy Development	4
1.2	The Evolution of Canadian Energy Policy	9
2.	Profile of Canadian Energy.....	15
2.1	Canadian Energy Production	15
2.2	Canadian Energy Consumption	17
2.3	Transportation and Distribution Networks	23
2.4	Transforming Canadian Energy	20
2.5	Ownership, Revenue, Taxation	23
2.6	Economic Profile of Canadian Energy.....	24
3.	Canada’s Energy Challenges	28
3.1	Forecasts of Future Canadian Energy Production and Consumption.....	28
3.2	Aging Infrastructure	29
3.3	Regulation and Privatization	31
3.4	Security of Supply and Import-Dependence	34
3.5	Aboriginal Consultation and Full Socio-Economic Participation	35
3.6	Canadian Energy Resources: Maximizing Economic Activity	37
3.7	Transporting Oil and Natural Gas	38
3.8	Managing Fossil Fuel Development.....	43
3.9	Environmental Consequences of Energy Development	45
4.	Energy and Climate.....	46
4.1	Industrial Civilization, Carbon Emissions and Climate Change	46
4.2	The Contribution of Energy Production and Usage	47
4.3	Constraining Greenhouse Gases.....	49
4.4	Possible Solutions: Carbon Pricing and/or Regulation.....	51
4.5	Principles for Making Carbon Pricing Beneficial.....	52

TABLE OF CONTENTS *(continued)*

5. A Better Vision for Canada’s Energy Future54

5.1 Production for Canadian Use54

5.2 Maximizing Economic Activity and Job Creation55

5.3 Output of Carbon-based Fuels must be Planned and Regulated56

5.4 Limiting Environmental Impacts and Greenhouse Gas Emissions.....57

5.5 Alternative Fuels, Green Energy, Carbon Pricing and Transition Measures59

5.6 Aboriginal Treaty Rights and Full Socio-Economic Participation.....61

5.7 Transporting Oil and Gas.....62

5.8 Privatization, Ownership, Regulation and Taxation63

6. Conclusion: Why This Matters64

6.1 Call to Action64

v. Bibliography65

List of Abbreviations

Bcm	Billions of Cubic Metres
Bpd	Barrels per Day
CAPP	Canadian Association of Petroleum Producers
COP	Conference of the Parties
CUFTA	Canada-U.S. Free Trade Agreement
EI	Employment Insurance
EITE	Emissions-Intensive Trade-Exposed
EU	European Union
GDP	Gross Domestic Product
GtCO ₂	Giga Tonnes of Carbon Dioxide
GHG	Greenhouse Gases
IPCC	Intergovernmental Panel on Climate Change
O&G	Oil and Gas
OPEC	Organization of the Petroleum Exporting Countries
Ppm	Parts per Million
Mt	Mega Tonne
MtCO ₂	Mega Tonnes of Carbon Dioxide
NAFTA	North American Free Trade Agreement
NEB	National Energy Board
NEP	National Energy Program
NGL	Natural Gas Liquids
NGO	Non-Governmental Organization
NOP	National Oil Policy
NYMEX	New York Mercantile Exchange
PIP	Petroleum Incentive Payment
R&D	Research and Development
SCC	Supreme Court of Canada
SUB	Supplemental Unemployment Benefit
TSX	Toronto Stock Exchange
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
WCI	Western Climate Initiative
WCSB	Western Canada Sedimentary Basin

List of Tables

Table 2.1	Canadian Oil Refineries and Upgraders	22
Table 2.2	Employment in Energy Related Industries	26
Table 3.1	Major Privatizations in Canadian Energy	32

List of Figures

Figure 2.1	Canada's Primary Energy Production Mix	15
Figure 2.2	Canadian Oil Production	16
Figure 2.3	Canadian Natural Gas Production.....	16
Figure 2.4	Electricity Generation in Canada	17
Figure 2.5	Energy Consumption by Fuel Type	18
Figure 2.6	Energy Consumption by Usage	18
Figure 2.7	Proportional Production and Consumption by Region	18
Figure 2.8	Resource Royalties in Alberta	24
Figure 3.1	Number of Rail Cars Carrying Crude and Fuel Oil	41
Figure 3.2	Price of Oil and the Relative Value of the Canadian Dollar	43
Figure 3.3	Exchange Rate and Manufacturing Employment.....	44
Figure 3.4	Exchange Rate and Canadian Export Performance	44
Figure 4.1	Global Carbon Emissions and Average Temperature	47
Figure 4.2	Carbon Dioxide Emissions from the Burning of Fossil Fuels	48

Executive Summary

Canada is a country rich in opportunity in part because it is rich in natural resources. Canada's renewable and non-renewable energy industries are a cornerstone of Canadian prosperity. These industries provide hundreds of thousands of mostly good-paying jobs, they are a prime target of business investment (domestic and foreign) and they pay taxes and royalties which help fund the high quality physical infrastructure and social programs that Canadians have come to expect. This document outlines Unifor's vision of a Canadian energy policy in six chapters.

The first chapter explores the history of major developments in the Canadian oil and gas industry and the policies that facilitated (or impaired) those developments. The second chapter develops a profile of Canadian energy, including what we produce, where we produce it, how much of it is produced, how we refine, process and transport it, what we consume and how much of it we sell to the world. Given the history around energy development (Chapter 1), and the economics of the industry (Chapter 2),



Chapter 3 outlines what Unifor sees as the crucial issues and policy challenges associated with future Canadian energy development.

The fourth chapter drills down into one crucial issue—the interplay between energy development and environmental degradation, including climate change. In that chapter Unifor outlines its stance on carbon emissions, including issues around carbon pricing and Just Transition for energy workers. The fifth chapter

outlines Unifor's guiding principles and the specific policy recommendations that are a by-product of those principles. The purpose of Chapter 5 is to outline Unifor's vision for a vibrant Canadian energy industry replete with good jobs, but constrained by Canada's international climate commitments and respect for Aboriginal treaty rights. Chapter 6 concludes by calling Unifor's membership to action so that Unifor's vision can be publicly communicated and politically implemented.

By defending private ownership and enforcing contracts, States assist in the creation of markets. Once citizens collectively decide that completely unregulated market exchange is undesirable—that some form of regulatory oversight is required, thus providing structure for market exchange—an energy policy becomes necessary. What might those regulations look like? How should markets be structured to avoid the most corrosive aspects of human behaviour, including selfishness, the avoidance of personal responsibility and short-termism, for example? Are there goals that market exchange should be structured to foster, such as job creation, employment stability, industrial dynamism, government revenue, equitable and inclusive prosperity and environmental stewardship, for example?

The purpose of an energy policy is to identify the challenges and opportunities associated with energy development and propose a suite of policies that would eliminate the negative aspects of energy development and foster the positive aspects. An energy policy must propose a set of achievable goals that would improve the functionality of the energy industry. Note the word ‘improve’. To improve something presupposes the realization of some value (stability, growth, efficiency and sustainability are examples of such values). The present document lays out a series of facts about the world. It also spells out some of the guiding values in the form of principles. The policies that emerge from this document should help close the gap between the how Canada’s energy industry currently operates (the intolerable present) and how it might better operate in the future.

Market mechanisms are powerful devices for allocating resources. No one could deny that. However, unhindered market exchange will not ensure that the economic benefits of Canada’s energy resources are maximized, or that greenhouse gas pollution will be curtailed, or that First Nations peoples will be properly consulted when energy development takes place on their traditional and treaty lands. This short list is not exhaustive. There are many aspects of Canadian energy development which require planning, regulatory oversight and democratic deliberation. Despite the power of price signals and free exchange, these mechanisms are insufficient to realize the values Canadians hold dear: economic security, equity, fiscal balance and environmental stewardship, to name just a few.

Crude oil, natural gas and associated energy products are not mere commodities to be produced, exchanged and consumed; rather, they are essential ingredients for modern living and thus have a ‘public good’ component to them, which is why Canadians are justified in utilizing their public institutions to shape and manage energy development. Unifor believes that the recent history of Canadian energy development, with its emphasis on unconstrained extraction for export, the absence of binding emissions targets, regional and fiscal imbalances, insufficient Aboriginal consultation and inclusion and a host of other policy failures are the reasons why a new approach to managing Canada’s energy resources is required.



Unifor's Vision for a Canadian Energy Policy

Canada's energy resources ultimately belong to Canadians, which is why Unifor believes they should be managed and developed in accordance with the following ten principles:

Good Jobs. Given the economic value and strategic significance of Canada's energy resources, Unifor believes that good job creation should be maximized;

Employment Stability. To counteract the boom-and-bust cycle, energy investment and expansion should be regulated so that energy workers and their communities can enjoy stable, secure livelihoods;

Deepening Industrial Linkages. Upstream, policy should encourage the maximization of Canadian content in the various inputs and supplies. Midstream and downstream, measures should be taken to encourage refining, processing and secondary manufacture;

Environmental Stewardship. Canada must abide by its international climate commitments and implement workable plans to reduce carbon emissions. Canada must also take measures to mitigate the negative environmental effects arising from energy development;

Green Energy. Active policies will be required to accelerate the industrial pivot away from emitting and non-renewable energy sources toward non-emitting renewable energy;

Just Transition. The industrial dislocation associated with the adjustment to green energy and clean technology should be counteracted by the suite of policies referred to as Just Transition, which includes labour market impact assessments, skills upgrading, retraining, flexible employment insurance and pension bridging, among others;

Respect for First Nations. Canada must live up to the constitutional commitments it has made with Aboriginal, Inuit and Metis Peoples. Unifor supports the principles embedded in the UN Declaration on the Rights of Indigenous Peoples, including the necessity of consultation and full socio-economic participation;

Macroeconomic Regulation. Government must be pro-active in regulating the macroeconomic and fiscal side-effects of resource booms, including interventions to stabilize the exchange rate so that export-industries are not damaged;

Fiscal and Regional Balance. A strong network of fiscal transfers within Canada must be maintained so that the benefits of resource developments are shared more broadly, and to prevent the emergence of large regional inequalities;

Resource Revenue and Social Development. Taxation levels and the resource royalty regime should ensure that Canadians receive fair long-run value for their resources. Resource revenues should be used to finance: policies that foster green energy and clean technology; Just Transition; and the social programs and physical infrastructure that enhance the value of Canadian citizenship.

1. History of Canadian Energy Development and Policy

Human beings have been extracting, utilizing and trading oil for five millennia. As far back as 3000 BCE, bitumen was being used in the Middle East as a building mortar. However, the modern oil industry is comparatively recent, having sprung up in North America in the 1850s. Coal was the dominant fuel source used to power modern industry at the time, but by the mid-twentieth century it would be displaced by oil and gas.

Daniel Yergin (1991) is one of the world's leading energy historians and he argues that there are three 'great themes' that underlie the development of the international oil and gas industry. The first is the rise of capitalism and modern business enterprise. Oil companies, private or public, consistently rank at the top of the list when it comes to profitability and market value. Second, oil is unique among commodities insofar as it is tangled up with national power struggles and geostrategic manoeuvring. Oil has been exceptionally important in the recent history of warfare, for example, and to a remarkable extent international politics is still shaped by the struggle to control the production, distribution and commercialization of oil (think of the 2003 U.S. invasion of Iraq). Third, the oil and gas industry not only gave rise to a hydrocarbon society; it also gave birth to a new civilization. Suburbanization, for example, would not have been possible without the petroleum-fuelled automobile.

All three of these themes have played out in Canada. So what are the origins of Canada's oil and gas industry? How have governments at the federal and provincial levels tried to foster and regulate energy development? And what might this history teach us about Canadian energy policy in the twenty-first century?

1.1 A Brief History of Canadian Energy Development

The North American oil and gas industry has distinctively Canadian origins. In 1846 a Nova Scotia physician named Abraham Gesner developed a process to refine a liquid fuel from coal, bitumen and oil shale. He named the new liquid 'kerosene', and for the remainder of the nineteenth century it would be widely used as a base fuel to illuminate homes and streets (Yergin 1991: 7). With the emergence of electrified lighting at the end of the nineteenth century, the kerosene industry perished. However, by 1914 the internal combustion engine—a major new power source used in automobiles—rescued the petroleum industry from extinction (Taylor 2009: 87).

While Gesner's discovery is widely known, less well known is the fact that the first oil-producing well in North America was drilled in Lambton County, Ontario (Pennsylvania is often treated as ground zero of the modern oil and gas industry, erroneously). In the nineteenth century the large deposits of oil and gas in western Canada and off the coast of Newfoundland were either unknown or undevelopable. The deposits of crude oil being extracted in southwestern Ontario in 1860s made the region something of

an energy centre. Small oil-drilling firms emerged at Oil Springs and Petrolia (between Lake Huron and Lake Erie), and London served as the local refining centre.

Imperial Oil was created in 1880 and within a decade it controlled roughly one-third of Ontario's oil and gas output. In the United States, John D. Rockefeller's Standard Oil had been acquiring competitors at



such a rapid rate that, by 1890, Standard controlled 90 percent of the U.S. market. Imperial Oil was absorbed by Rockefeller in 1898, and with it, virtually the entire Canadian market fell under foreign control. This impaired, rather than facilitated, the development of Canadian energy. In the decade following the takeover of Imperial Oil, many of its refineries were shuttered and the few that remained open were managed by a Standard Oil subsidiary in Buffalo.

Other international energy companies had Canadian operations from the early twentieth century onward. By the end of the Second World War, Canada's three major integrated energy companies were foreign-owned. And by the late 1960s, five multinational firms—Imperial, Shell, Texaco, Gulf and British Petroleum—controlled nearly half of Alberta's crude oil output (Taylor 2009: 88-89, 158). Bliss (1987: 522) tells us that the overwhelming size of U.S. firms in combination with the

favourable tax treatment they received for their exploration activities in foreign countries are two reasons why U.S. energy firms dominated the Canadian industry.

These historical facts tell us two things of significance when it comes to Unifor's energy policy. From the very outset the Canadian oil and gas industry has been heavily foreign-owned. This poses a challenge when it comes to regulating and developing Canada's energy resources in line with Unifor's principles and priorities. And second, Canadian energy was always nested within a North American energy system. This is why Canada's energy grid tends to be positioned on a north-south axis, rather than connectivity and distribution networks running from west to east.

It was in the early eighteenth century that explorers first noted the petroleum deposits in the Athabasca River region, but it took until 1917 for Imperial Oil to begin its exploration and drilling operations (after obtaining a concession from Canadian Pacific Rail).¹ Tar sands extraction had been attempted numerous times over the years, often with government support, but the economics were so unfavourable that operations soon terminated (Bliss 1987: 519). It wasn't until 1947 that Imperial hit the jackpot: the discoveries (of conventional oil) made at Leduc and Redwater, near Edmonton, would transform the Canadian energy industry and usher in Alberta's 'age of oil' (Easterbrook and Aitkin 1956: 549).

Earlier discoveries in the Turner Valley fields (in 1914) were dwarfed by the finding at Leduc (in 1947), which in turn were dwarfed by discoveries made in the 1950s. In the 1920s and 1930s, 95 percent of the petroleum consumed in Canada was imported (Bliss 1987: 519). The findings in the late 1940s and early 1950s were so large that for the first time in Canadian history, oil and gas self-sufficiency could be seriously entertained. With the advent of major discoveries, energy exports and pipelines became increasingly important issues. Should pipelines run on a west-east grid to secure supply for Canadians—making them akin to the railways in terms of their nation-building significance—or should they be created on a North American basis, with the closest, cheapest source of fuel being the determining factor, irrespective of nationality?

Oil refineries and petroleum and natural gas markets were concentrated in southern Ontario, which meant the economic pull was to have pipelines run from Alberta south of the Great Lakes, which would make northern Ontarians reliant on more costly coal and oil for heating. If pipelines were routed north of the Great Lakes—entirely through Canadian territory—northern Ontarians would be pulled into an all-Canadian energy system, but the cost to consumers in southern Ontario's golden horseshoe would increase. These difficult choices pulled Ottawa into the decision-making process, and by extension, deeper into Canadian energy development.

C.D. Howe was an influential politician in Ottawa and he believed that an all-Canadian natural gas line was both practical and necessary, despite opposition from business. The ensuing 'pipeline debate' of



1956 over the Trans-Canada line would help dislodge the St. Laurent Liberals from power in 1957, but not before the Canadian Government loaned TransCanada Pipeline Company (a private U.S. firm) the money to build the pipeline through Canadian territory, which ensured Canadian control of the line and northern Ontarian access to Alberta's natural gas (Taylor 2009: 159).

In addition to direct federal involvement in pipeline projects, the Alberta Government chartered the Alberta Gas Trunk Line Company in 1954 to gather natural gas from wellhead and transport it through Alberta to consumers and to export pipelines at Alberta's borders (including to the Trans-Canada line at the Saskatchewan border). From the very outset, then, government intervention in pipeline decisions—including the route taken, market access and financing—was present. The AGTL was not a Crown corporation even though the provincial government held shares in it, but its existence also meant that public ownership was an important part of early Canadian energy development. The AGTL eventually moved beyond its initial role as carrier of natural gas. In 1979 it acquired control of Husky Oil, and it expanding into petrochemicals and production equipment for the oil and gas industry (Taylor 2009: 160).

There was contention around oil pipelines as well. Those who saw energy and pipelines as nation-building instruments wanted a pipeline that connected Alberta not just with Ontario's refineries and consumers, but with markets in Quebec and the Maritimes. Those who opposed the extension of oil pipelines east of Ontario argued that it was often cheaper to import oil from abroad than to transport Alberta crude beyond Ottawa, not just because of the transportation costs, but because western Canadian crude was more expensive than foreign-produced crude. Bliss (1987: 525-529) tells us that, through its own pipeline system or through joint partnerships with pipeline companies, Imperial Oil was the pipeline leader in the early 1950s, having built lines running eastward from Edmonton, via Wisconsin and Michigan, to refineries in Sarnia, and westward from Edmonton, via Yellowhead Pass and down the Fraser River, to refineries in Vancouver.

Despite the major oil discoveries and ensuing buildup of pipeline capacity between the late 1940s and the late 1950s, by the mid-1960s there was a slowdown in new oil discoveries. Accordingly, oil majors began planning their tar sands extraction plants at this time. However, the unconventional oil near Fort McMurray posed a threat to the conventional oil being produced elsewhere, which is why the Alberta government only allowed one new project—Sun Oil's Great Canadian Oil Sands plant—to be built. Small Canadian independents began redirecting their exploratory efforts to the Arctic, sometimes with assistance from the federal government (Bliss 1987: 531).

In 1971 the Lougheed Progressive Conservatives came to power in Alberta on a platform emphasizing a reset of provincial royalties from oil production on Crown lands. Lougheed argued that Albertans required a larger share of the income from oil and gas development so that the province's physical and social infrastructure could be built up. Lougheed also wanted to diversify Alberta away from natural resources, partly because of the negative consequences arising from the boom-bust cycle (which was

readily apparent in energy-rich regions like Oklahoma), but also because of declining reserves. In 1976 Lougheed created the Alberta Heritage Fund to help finance diversification. The Alberta Energy Company, in which the province held a 50 percent take, was established to develop the petrochemical industry and finance tar sands expansion (Taylor 2009: 160). A short two years later, in 1973, the OPEC energy crisis led Ottawa on a diametrically opposed course insofar as the federal government believed that it had a larger role to play in securing Canada's energy needs (Bliss 1987: 532).

In 1973-74 oil prices soared. The Lougheed Government in Edmonton responded by raising royalties (which angered segments of Alberta's business class). The Trudeau Government in Ottawa responded with a new tax to capture a portion of the monopoly profits flowing to Canada's oil exporters. Trudeau also froze the domestic price of oil to shield Canadian consumers from the higher world price (Bliss 1987: 532-3). Resource development in the 1970s was characterized by new attempts to regulate the energy industry and steer energy development in the service of provincial and national goals. There were some important discoveries made in this decade, including one of the largest natural gas finds in Canadian history (namely, the Elmvale area of west-central Alberta) and the billion barrels of oil discovered by Chevron Standard in the West Pembina pools. The Syncrude tar sands mega project was operational by 1978. Despite these industry developments, the 1970s and early 1980s will be remembered for the resource politics that dominated Canadian national life.



Even though offshore exploration in the Atlantic began in the 1960s, it took until 1979 to make a major discovery. Chevron and Mobil together found a billion-barrel well at the Hibernia site off the coast of Newfoundland. Through Petro-Canada and a new Crown corporation—Canada Hibernia Holding Company—the Mulroney Progressive Conservatives helped ensure the development of this mega project, which held out the promise of considerable wealth for Newfoundlanders. After several aborted start-up attempts, the federal government increased its liability in the project (via the Canada Development Investment Corporation) and production of the platform itself finally began in the early 1990s, with Chevron commencing formal operations in 1997. Reserve estimates for Hibernia are much smaller than the oil sands, but official estimates peg the field at 1.4 billion barrels of recoverable oil.

Even though oil sands production began in 1967 with the Great Canadian Oil Sands plant in Fort McMurray (then controlled by Sun Oil Company, now Suncor Energy), the true extent of the oil sands deposits weren't known until the 1970s. The Syncrude mine (which opened in 1978) is the largest mine

in the world, covering 140,000 km². With the collapse in the price of oil after 1981, there was a two decade lull in new oil sands projects. It wasn't until 2003 that new projects were initiated. In 2005, the Alberta Department of Energy estimated that the largest oil sands field—the Athabasca field—contained more than 120 billion barrels of recoverable bitumen (convertible to crude oil using current technology) and that the total potentially recoverable amount totalled more than two trillion barrels (Taylor 2009: 250).

Between 2003 and 2014 (minus the Great Recession of 2008-2009), oil prices soared to historic highs, which lured enormous sums of domestic and foreign investment funding into the oil patch. However, the shale revolution in the U.S., which began in 2009, meant ever-more crude was rolling into North American energy markets. And with the OPEC cartel's cooperation unravelling, and members flooding the market with inventory, the world price of oil dramatically declined, falling from \$105 per barrel in 2014 to below \$30 in 2016. This has led to the cessation of new projects, the idling of much productive capacity, the bankruptcy of some oil firms, large deficits for producing provinces and thousands of job losses.

1.2 The Evolution of Canadian Energy Policy

The Canadian Constitution prescribes that the provinces own and control the land and resources within its borders. Authority is also given to the provinces when it comes to legislation around non-renewable resource exploration, development, management, conservation and the royalty regime.² However, the federal government might not have granted Alberta control over its sub-soil resources in 1930 had it believed the oil fields in Alberta were commercially viable. Alberta's Oil and Gas Conservation Board emerged in 1938 to help arbitrate disputes in the industry. Although officials in Ottawa (namely C.D. Howe) and the Alberta Government were eager to promote natural gas exports, as early as 1949 the Oil and Gas Conservation Board was given the authority to ensure that exports didn't threaten Alberta's long-term natural gas needs (Taylor 2009: 159).

The Royal Commission on Energy, chaired by Henry Borden, led to a National Oil Policy (NOP) in 1961. The Borden Commission recommended that markets west of the Ottawa valley should be reserved for Canadian oil, while eastern markets could import oil. In practice, this meant Ontario's consumers paid a premium over world prices of a few cents per barrel to support the Alberta oil industry. The Borden Commission also recommended the creation of the National Energy Board to regulate the oil and gas industry, including a mandate to determine exports to the U.S. At that time, Alberta oil producers were demanding increased market access for their surpluses. By the late 1960s, western Canada was shipping nearly one million barrels per day (bpd) to the U.S., which was roughly equivalent to the amount of oil eastern Canada was importing. Approximately half of Canada's natural gas was also being exported (Bliss 1987: 529).

Attempts to federally regulate and Canadianize the oil and gas industry may not have happened had it not been for the two-pronged energy crisis of the 1970s. OPEC restricted its oil exports to the West in 1973-74 as punishment for the latter's support for Israel in the Yom Kippur War. The embargo led to a quadrupling of oil prices in less than 12 months, soaring from \$3 to \$12 per barrel (Bliss 1987: 533). This prompted the Trudeau government to implement a set of national energy policies designed to foster self-sufficiency and reduce the scale of the energy shock.

In the late 1970s, the regulatory framework for oil in Canada and the U.S. had many similarities. In the U.S. there were price controls at wellhead (set by the Federal Energy Regulatory Commission in the U.S.) and pipeline fees and tolls were politically managed. The price of refined petroleum products was largely driven by market forces. In Canada, crude oil was sold on short-term contracts and the price of the crude that moved between provinces or nations was regulated by the federal government, with exports requiring authorization from the National Energy Board (NEB). Canadian-produced crude was also subject to volume and export restrictions (Plourde 2005: 53-4).

The regulatory framework for natural gas was also comparable in Canada and the U.S. Plourde (2005: 53-4) tells us that a large number of natural gas firms produced the commodity and sold it to pipeline companies, which shipped the fuel to regulated monopolies (called local distribution companies). Natural gas prices were managed at two points in the industrial chain: at wellhead and to the final user, with the federal government determining prices at the point of delivery and the NEB administering pipeline charges.

During the crisis of 1973-74, Ottawa encouraged conservation measures, extended the Interprovincial pipeline from Toronto to Montreal to supply eastern Canada with western crude, restricted oil and gas exports, supported frontier exploration and development and backed new tar sands projects (including the Syncrude project, which began operating in 1978). New tax measures ensured that the federal treasury captured a share of the oil super profits, and domestic controls held oil and gas prices below world levels, which helped shield Canadian consumers from the full effects of the shock (Bliss 1987: 533-4).

Major discoveries of oil and gas in the late 1970s helped calm fears about dwindling supply, but resource development and regulation became an increasingly contested affair, with the oil and gas business class in Alberta staunchly opposing Ottawa's efforts to control the trajectory of Canadian energy development. Matters weren't helped when Petro-Canada—the publicly-owned oil company—was created in 1975. Petro-Canada's original mandate included frontier exploration in Canada's north and a commitment to carry out research in synthetic fuels and other unconventional energy sources (Taylor 2009: 187-8). These activities, which were essential to the long-run vitality of the industry, were costly and unprofitable in the short-run, which is why business was eager to avoid them. Petro-Canada eventually widened its activities beyond exploration (a partial response to the fact that exploration



tended to be a money-losing activity) to tar sands and heavy oil development, including the production of crude oil and natural gas, petroleum refinement and the sale of gasoline to the final customer.

In order to penetrate the market for midstream and downstream products,

Petro-Canada acquired Pacific Petroleum in 1978 for \$1.5 billion—making it the largest acquisition in Canadian history (Bliss 1987: 539). Petro-Canada would go on to acquire assets held by Petrofina (the Belgian-owned firm) and British Petroleum’s Canadian holdings, including a network of refineries and service stations. By the time Petro-Canada acquired Gulf Canada’s refining and market operations in 1985, it was the second largest energy firm in Canada (by assets) and controlled nearly one-fifth of the petroleum retail market (Taylor 2009: 188).

In 1979 the Joe Clark Progressive Conservatives came to power in Ottawa promising to undo much of the Liberal energy policy. Had it not been for the Iranian revolution of that year and another OPEC-induced price shock (which saw prices double from \$14 to \$28 per barrel), the Clark Government might have succeeded in undoing Trudeau’s energy measures. Trudeau ran a winning campaign that centred on energy self-sufficiency and Canadianization of the industry. The National Energy Program (NEP) was introduced in October of 1980 and it included a wide range of policies, including taxes, prices, grants, charges and provisions around nationality (Bliss 1987: 540-1).

One reason the NEP was such a complex policy was the multiple objectives it sought to achieve. One goal—a 50 percent Canadianization of the industry within the decade—would be reached by offering Petroleum Incentive Payments, which would cover 80 percent of the costs of drilling on Canadian Lands. These PIPs were only available to firms that were 75 percent Canadian-owned. All firms active on Canada Lands would have to forfeit a 25 percent stake in their holdings to Petro-Canada (or some other Crown corporation). Private Canadian-based firms were encouraged to acquire foreign assets, while foreign-based firms would have fewer expansion opportunities in the oil and gas sector (because of stipulations in the Foreign Investment Review Act).³ Another objective of the NEP was to shield Canadians from world energy prices through a lower, federally-administered price system. Another objective was the elimination of crude oil net exports to the U.S. Yet another objective was the creation of new revenue streams for Ottawa through national taxes on petroleum and natural gas, which had the effect of limiting the revenue flowing to producing provinces (Bliss 1987: 542).

The NEP was predicated on high and rising energy prices, but by 1982 it became clear that OPEC's ability to sustain an inflated price had begun to wither, and the world price of oil began a two decade-long slide. It wasn't just the economics that were unfavourable to the NEP; the program was derided from within by the Alberta Government, and without by the multinational oil companies (who were adversely affected by the program) and by the newly minted Reagan Administration in Washington. The way Taylor (2009: 189) recounts it, even many small Canadian firms were hostile to the NEP, despite being direct beneficiaries of the program. The Mulroney Progressive Conservatives came to power in 1984 promising to dismantle the NEP, which they did. However, because Petro-Canada was so deeply integrated into Canada's energy system, privatization of the Crown corporation proved more difficult. It was finally sold off in 1991, even though the federal government retained a 20 stake in the firm and restricted foreign ownership to 25 percent. This was an important, but by no means the only, policy shift in North American energy markets.

From a policy perspective, Doern (2005: 8) tells us that the mid-1980s onward was characterized by deregulation, trade and investment liberalization and a pro-market approach to development and sustainability. After decades of price regulation, the Western Energy Accord signed in 1985 between Ottawa and producing provinces in western Canada deregulated oil, which effectively meant a reversion to continental energy markets and pricing. This marked the end of the 25 year effort to politically manage crude oil prices, which had begun in 1961 with the National Oil Policy. The deregulation of natural gas followed, which weakened the monopoly powers of pipeline and distribution companies.

The Canada-US Free Trade Agreement (CUFTA), which was signed in 1988, effectively locked in the deregulated, continentalized energy market and prevented the future use of a two-priced system. In exchange for secure access to U.S. markets for oil and gas, Canada locked itself into an export arrangement that prioritized U.S. energy security. The so-called 'proportionality clause' meant that

Canada could not arbitrarily restrict product to established U.S. customers, even in the case of a Canadian shortage. The proportion being sold to the U.S. had to remain fixed. Some saw the CUFTA and the NAFTA that followed it in 1994 as 'constitutionalizing' the North American energy system, thus making it much more difficult for future governments to politically manage energy development (Doern 2005: 9).

Deregulated oil markets in Canada and the U.S. meant the cessation of wellhead price administration and an end to the



restriction of cross-border, especially international, transactions. The U.S. had deregulated its markets by the late 1970s; in Canada it took until the late 1980s. Until that time, there had been a spread between Canadian and U.S. crude prices, but with deregulated markets the price differentials began to be more reflective of quality and transportation costs (the basis for arbitrage having been eliminated). Oil prices were financialized, meaning traders used spot and futures markets to price commodities (on the NYMEX—the New York Mercantile Exchange), in an effort to reduce the risk associated with volatility (Plourde 2005: 56, 60-1).



The deregulation of natural gas followed a similar arc. Regulatory oversight of natural gas was more extensive than oil insofar as almost all transactions (including prices, volumes, pipeline tolls, tariffs and length of contract) were overseen by public agencies or government. The federal government assumed responsibility for price management and export controls (via the NEP) in 1980, but three short years

later the federal government began to relax domestic price controls, creating more room for prices to be set by market players, and the year after that international transaction price controls were eased. Deregulated pricing and exports intensified after 1985, and with the advent of CUFTA in 1989, a deregulated natural gas market was effectively ‘locked in’ (Plourde 2005: 64-7).

Without breaking from the Mulroney PC’s market-based approach to energy development, the Chretien Liberals emphasized three main objectives in their energy policy: a competition- and innovation-based framework for long-term energy development; the encouragement of responsible environmental stewardship (through environmental assessments of energy projects, for example); and security of competitively-priced energy supplies (Doern 2005: 11-12). The market reliance exhibited by the Mulroney and Chretien Government’s suggested that oil and gas were no longer commodities of strategic or national significance.

In much of the period spanning 1945 and 1985, federal and provincial governments perceived Canadian energy resources to be scarce, which helped inspire a policy orientation of energy security, self-sufficiency and market inadequacy. The Mulroney Government represented a break with this policy orientation, and all subsequent federal governments have followed the market-based approach to development and regulation. Major regulatory bodies include the National Energy Board, the Canadian Environmental Assessment Act, the NAFTA and various other pieces of legislation (Doern 2005: 12-13). Nowhere is the market-based approach to development and regulation more apparent than in Alberta (the Notley Government notwithstanding). Doern (2005: 33-4) tells us that the Alberta Department of Energy’s stated development goals during the most recent energy boom included the optimization of

resource revenues for Albertans, the removal of barriers to development, competitiveness, security of supply and customer choice, among others.

Despite the pervasiveness of the laissez-faire approach to oil and gas development, royalty arrangements have re-emerged as a political issue since the energy boom began in 2003. For example, as Premier of Newfoundland, Danny Williams negotiated a five percent equity stake in the Hebron offshore project for the province with the energy companies (Husky, Petro-Canada, Chevron, ExxonMobil and Norsk Hydro), on top of a more favourable royalty regime (Taylor 2009: 250-1). With the rise of Aboriginal nationalism and the maturation of the environmental movement, Canadian energy development and policy has become more hotly contested in recent years. As of 2016, it is unclear if we will see a fundamental policy realignment when it comes to Canadian oil and gas. When energy prices are high and business is booming, it is difficult to demand a re-think of the development and regulatory model. But with depressed prices and market inactivity, Unifor believes that the opportunity has arisen for a rethink of how to develop and strategically manage Canadian energy.



2. Profile of Canadian Energy

Former Prime Minister Harper famously referred to Canada as an ‘energy superpower’. He was right. Oil remains the single most important global fuel source, and with 173 billion barrels of recoverable oil, Canada has the third largest proven reserves in the world, topped only by Venezuela and Saudi Arabia. In 2014 the U.S. overtook Saudi Arabia as the world’s largest oil producer. At 4.3 million barrels per day, Canada ranked fourth in terms of oil production, one spot behind Russia. According to Statistics Canada (2016: 7), Canada is the fifth largest producer and fourth largest net exporter of natural gas. Canada is also the third largest producer of hydro power, the second largest producer of uranium and it ranks second in terms of improvements in energy efficiency among International Energy Agency countries. In terms of renewable energy, Canada ranks seventh in wind capacity. There is no doubt that Canada is in an enviable position when it comes to energy.

The present section develops a profile of Canadian energy, including details about production, transportation, transformation and consumption. Included in the description are details about GDP, employment, trade, revenues, taxes and ownership. The purpose is to capture the economic and geostrategic significance of energy in Canadian prosperity.

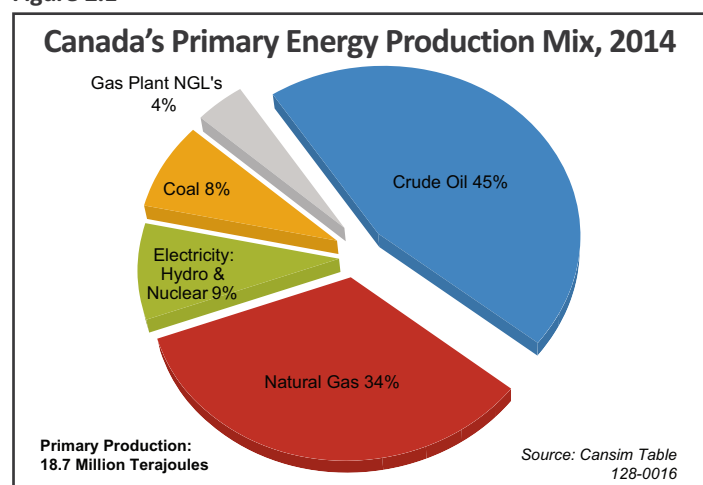
2.1 Canadian Energy Production

In 2014, primary energy production in Canada amounted to 18.7 million terajoules.⁴ Over the past decade primary energy production has been growing at an annual rate of 1.3 percent and overall production levels have risen 30 percent since 1995. Fossil fuels make up the bulk of primary energy production. Crude oil accounts for 45 percent of the total, with natural gas accounting for 34 percent, coal eight percent, gas plant natural gas liquids (NGL’s) four percent and hydro and nuclear electricity—the only non-emitting fuel types—making up the remaining nine percent (see Figure 2.1).

Canada’s secondary energy production, which amounted to 5.1 million terajoules in the most recent data year, was dominated by refined petroleum products, which accounted for 88 percent of the total. Thermal electricity accounted for a further 10 percent of secondary energy and the remaining two percent was divided between coke and coke oven gas.

In 2014 Canadian oil reserves stood at 173 billion barrels, down from 182 billion

Figure 2.1



barrels in 1999. This implies that Canada's reserves account for 10 percent of the global total. Venezuela possesses 18 percent of proven reserves and Saudi Arabia accounts for 16 percent. The oil sands ('unconventional oil') make up 97 percent of Canada's proven oil reserves, up from 80 percent in the early 1980s. The Government of Newfoundland & Labrador estimates its offshore oil potential at six billion barrels.

Newfoundland & Labrador has three offshore oil projects currently in production: Hibernia, Terra Nova and White Rose. At the beginning of 2016, these projects produced 200,000 bpd of oil, according to the CAPP. The fourth project, Hebron, is expected to begin production in 2017. Canadian oil production has steadily grown over the decades and in 2014 it reached 4.3 million barrels per day (bpd)—an all-time

high (see Figure 2.2). At five percent of total global production, Canada was the fourth largest oil producer in the world. Canadian oil production is concentrated in three regions: Alberta (77 percent of the total), Saskatchewan (13 percent) and Atlantic Canada (six percent).

With 2 trillion cubic metres (17.3 billion boe) of natural gas, Canada's reserves account for 17 percent of the North American total, but just one percent of global reserves. With 18 percent of the global total, Iran has the world's largest reserves. Canada ranks fifteenth in terms of proven natural gas reserves. With 162 billion cubic metres produced in 2014, Canada was the world's fifth largest natural gas producer (see Figure 2.3). Only the U.S., Russia, Qatar and Iran produced more. Natural gas production has decreased nearly 15 percent since 2000, and Canada's global share of production has fallen from eight percent in the late 1990s to five percent in 2014.

As with oil, the bulk of Canada's natural gas is produced in Alberta (70 percent). British Columbia accounts for 24 percent, with the remaining six percent split between Saskatchewan and Atlantic Canada.

Figure 2.2

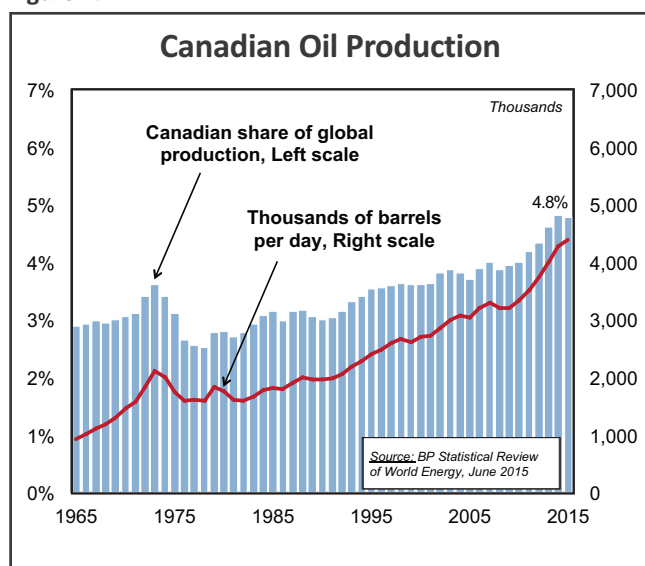
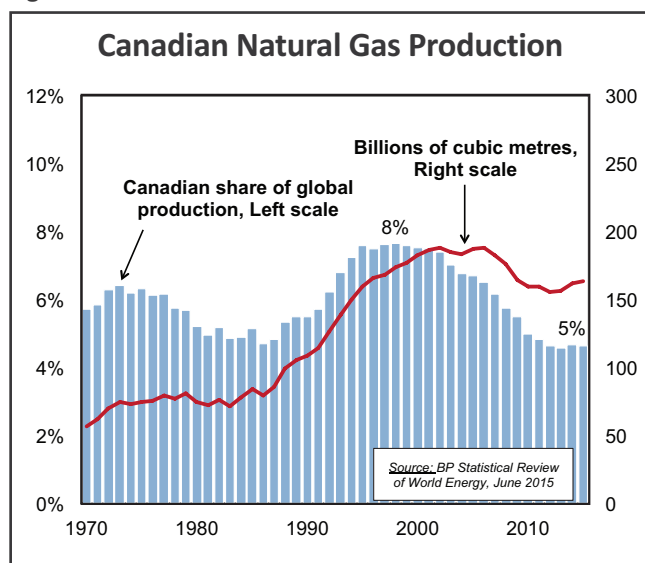


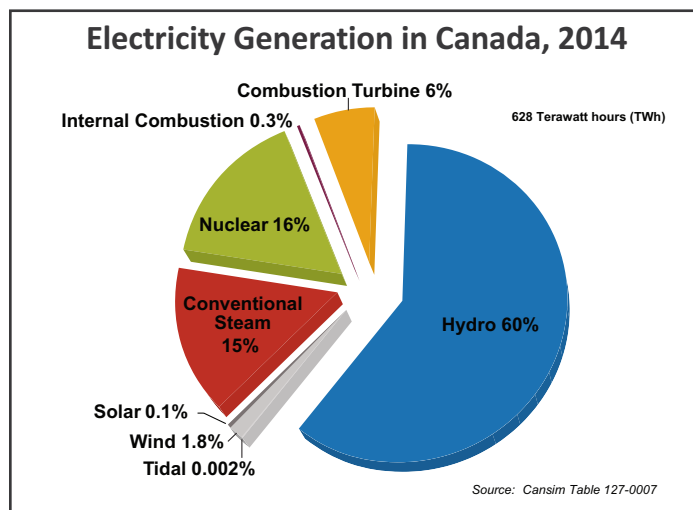
Figure 2.3



Canada's coal reserves amount to 6.6 billion tonnes, which is less than one percent of the global total (the U.S., Russia and China together have 57 percent of the global total). Because of the phase-out of coal-fired electricity plans, Canadian coal production has fallen by more than 10 percent compared to the mid-1990s, and Canadian production in 2014 amounted to less than one percent of the global total. Western Canada also dominates coal production, with 45 percent, 40 percent, and 10 percent, respectively, produced in British Columbia, Alberta and Saskatchewan.

Alberta is Canada's largest producer of refined petroleum products, with 30 percent of the total. Ontario and Atlantic Canada each account for 23 percent of the total and Quebec accounts for 17

Figure 2.4



percent. Alberta is also the largest producer of thermal electricity, at 53 percent of the total. Saskatchewan, Ontario and Atlantic Canada each account for 13 percent of thermal electricity production.

In terms of electricity production, which amounted to 628 terawatt hours in 2014, 60 percent is derived from hydraulic turbines (see Figure 2.4).⁵ A further 16 percent comes from nuclear steam turbines and 15 percent comes from conventional steam turbines (much of this would be coal-

fuelled). Unconventional renewable energy sources such as wind, solar and tidal make up less than two percent of Canada's electricity generation.

Unlike oil and natural gas, which are heavily concentrated in Western Canada, national electricity production is more reflective of underlying demographics. Quebec is the largest producer of hydro and nuclear electricity, with 40 percent of the total, followed by Ontario (with 28 percent of the total), British Columbia (12 percent), Atlantic Canada (10 percent) and Manitoba (seven percent).

2.2 Canadian Energy Consumption

Figures 2.5 and 2.6 break down energy consumption in Canada by fuel type and by usage. The single largest fuel type consumed in Canada is oil (at 31 percent), followed by natural gas (28 percent), hydroelectric (26 percent), nuclear (seven percent), coal (six percent) and renewable energy sources (two percent). On the whole, then, Canada's non GHG-emitting fuel sources account for 35 percent of total Canadian energy consumption, far above the European Union average of 24 percent and the global average of 13 percent.

Figure 2.5

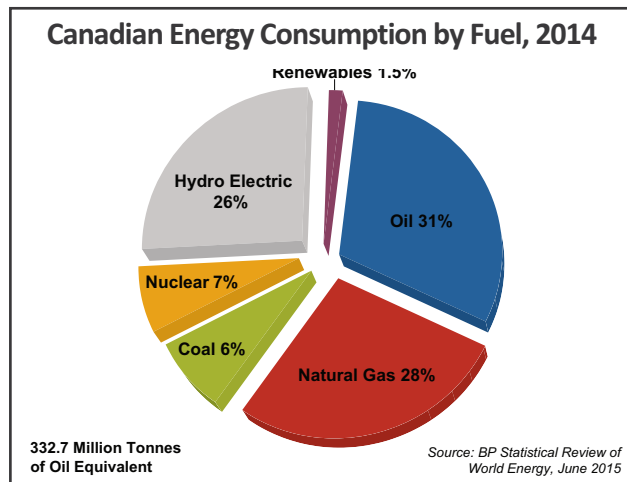
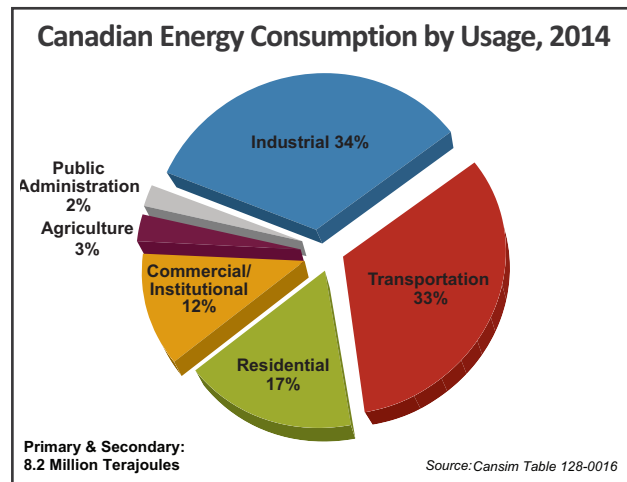


Figure 2.6



The major difference between Canada and other jurisdictions in terms of ‘clean’ energy sources is the relative prevalence of hydro, (which accounts for one-quarter of Canadian energy consumption, but only seven percent of world and five percent of EU consumption) and the comparative insignificance of coal (which only accounts for six percent of Canadian energy consumption, but 30 percent of world and 17 percent of EU consumption).

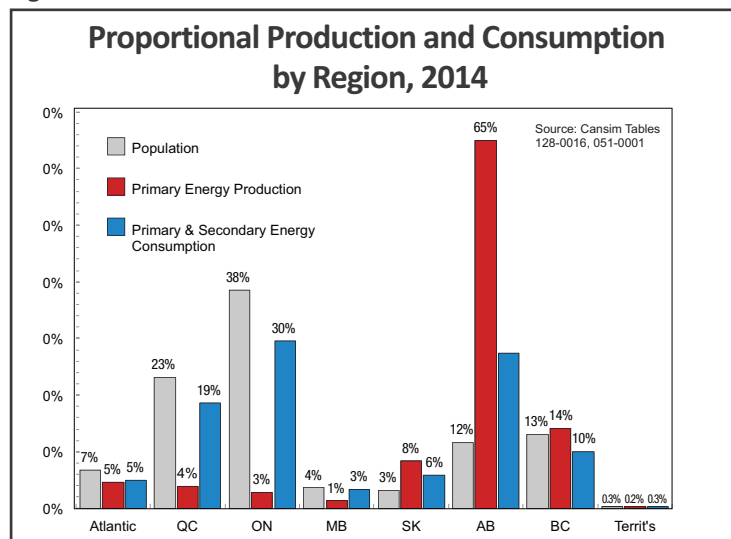
Moving from source to usage, two-thirds of Canadian energy consumption is utilized in industrial production and transportation—at 34 percent and 33 percent, respectively (see Figure 2.6). The next largest usage of energy is residential (at 17 percent), followed by commercial and institutional (12 percent), agriculture (three percent) and public administration (two percent).

Figure 2.7 contrasts the population of each region in Canada (grey bars) with proportional energy production (red bars) and consumption (blue bars). The chart clearly shows how heavily concentrated energy production is in Western Canada.

With only 12 percent of Canada’s population, Alberta produces 65 percent of total primary energy. Despite the relatively small population, Alberta also consumes 27 percent of primary and secondary energy. This makes Alberta the second largest energy consumer in Canada, behind Ontario (30 percent) and ahead of Quebec (19 percent).

British Columbia and Saskatchewan are the next largest producers, with 14 percent and eight percent, respectively.

Figure 2.7



It is worth noting that energy-intensive provinces like Alberta and Saskatchewan are also agriculture-intensive provinces, which is one factor contributing to above-average GHG emissions.

At 5 percent of the total, Atlantic Canada is the fourth largest energy producer. Every other province/region consumes more than it produces (and is thus a net importer of energy). Ontario, for example, only produces three percent of Canada's primary energy but consumes 30 percent of primary and secondary energy.

2.3 Transportation and Distribution Networks

Canada's oil and natural gas pipeline infrastructure includes roughly 840,000 km of transmission trunk lines, gathering system field lines and distribution lines, according to Natural Resources Canada. Pipelines that cross provincial and national borders—roughly 73,000 km worth—are regulated by the National Energy Board. Pipelines that are situated in just one province are regulated by provincial authorities, including the smaller natural gas distribution pipelines that are connected to residences equipped with a natural gas furnace or water heater. Alberta, for instance, regulates more than 400,000 km worth of pipelines.

Most pipelines are located in the Western Canada Sedimentary Basin (WCSB). According to Natural Resources Canada, 1.2 billion barrels of oil travel through Canada's pipeline infrastructure each year. All tallied, this infrastructure transports some \$100 billion dollars in oil, natural gas and petroleum products. Canada's pipeline capacity is aging. This is both a challenge and an opportunity. According to the International Monetary Fund, addressing Canada's energy infrastructure requirements could increase Canada's GDP by two percent (or \$40 billion) by 2020. Although pipelines transport the bulk of Canadian oil—and are generally safer and less expensive—in 2014 more than 600,000 bpd of crude oil and petroleum products were transported by rail.

Edmonton is the pipeline capital of Canada. Most Canadian oil is assembled there before being distributed through 11 pipelines, three of which carry the bulk of Canada's crude.⁶ Some of the key pipelines carrying Canadian oil, petroleum products and natural gas, or pipelines connected to refining centres, are listed below.

- Enbridge runs numerous pipelines throughout North America, the largest of which is the Canadian Mainline crude oil and dilbit pipeline, which carries 1.4 million bpd through a 5,000 km system. Dating back to 1950, Canadian Mainline runs eastward from Edmonton through Hardisty and Regina, eventually connects with refineries in Sarnia and in Superior, Wisconsin, and ends in Montreal.
- The Kinder Morgan Trans Mountain pipeline system has been in operation since 1953 and carries crude oil and refined products from the oil sands, via Edmonton, to terminals and refineries in the greater Vancouver area. The Express Pipeline, also operated by Kinder Morgan, transports crude oil

from Hardisty, Alberta to Casper, Wyoming along 1,200 km of pipeline. The 3,000 km-long Kinder Morgan Cochin pipeline carries natural gas liquids from Fort Saskatchewan, Alberta, to Sarnia, Ontario.

- TransCanada also runs a number of pipelines, including its Keystone pipeline system, which carries crude oil from Hardisty, Alberta to refineries in Illinois and Texas and to oil tank farms in Cushing, Oklahoma. The first two phases of the three-phase pipeline system have a 590,000 bpd capacity.
- Suncor runs a 400 km pipeline from Fort McMurray to Edmonton which carries crude oil and refined products.
- The TransNorthern pipeline shuttles refined products from Nanticoke to Montreal.
- The Portland-Montreal pipeline connects a tanker unloading facility in Portland, Maine with the Montreal refinery.
- Canada's largest natural gas pipeline system is operated by TransCanada. The 23,000 km-long Alberta System gathers natural gas for use in Alberta, while the 14,000 km-long Canadian Mainline transports natural gas from the Alberta-Saskatchewan border to the Quebec-Vermont border.

It is worth noting that, at present, some of the refineries in Eastern Canada are not connected by pipeline to the oil produced in Western Canada. Canada's pipeline infrastructure can take Western hydrocarbons as far as Montreal. Crude oil produced in western Canada fulfills the capacity requirements of refineries in the West and more than three-quarters of Ontario's refinery capacity. And with Enbridge's 300,000 bpd Line 9 flow reversal project, Canadian crude began arriving in Montreal at the end of 2015. Canada's Eastern refineries import oil from a variety of sources. The U.S. recently became the largest foreign source of oil, but OPEC countries such as Algeria, Saudi Arabia, Nigeria and Iraq have supplied oil to Eastern Canada, in addition to North Sea countries like Norway and the U.K.

2.4 Transforming Canadian Energy

Globally, Canada accounts for 10 percent of oil reserves and five percent of oil production, but just two percent of refining capacity. This partially reflects the fact that Canada shares a border with the largest refiner of crude oil in the world (the U.S. accounts for 18 percent of the global total). However, Canada's relative lack of refining capacity also reflects the extractive mentality displayed by successive generations of Canadian policy-makers, who have not made it a political priority to maximize the economic activity arising from Canada's energy resources.

Canadian refining capacity is just shy of two million bpd. Despite the fact that Canadian oil production has tripled since the late 1970s, refining capacity is lower today than it was in 1978, when capacity stood at 2.2 million bpd. Refinery throughputs fell between 2007 and 2014, from 1.9 to 1.7 million bpd. Amazingly, over this period North American oil production increased by one-third, which implies that the surge in Canadian (and U.S.) bitumen and crude oil production is being absorbed by refineries in the U.S. or outside North America altogether.



Economic experts have modelled the employment effects of increased bitumen exports to capture the trade-off between increasing export pipeline capacity and domestic oil processing (Infometrica 2012). The econometric model suggests that an increase in export pipeline capacity of 400,000 bpd translates into 18,000 fewer jobs in the Canadian refining industry. This finding reinforces the policy position taken by the former CEP, namely that the export of raw bitumen costs the Canadian economy thousands of good jobs (see Communications, Energy and Paperworkers Union of Canada 2009).

In the early 1980s—at the tail end of the last energy boom—Canada accounted for 11 percent of North American oil production and 10 percent of refining capacity, which implied a degree of balance between the extraction and manufacture of oil. Fast forward three decades, and Canada accounted for 25 percent of North American oil production but just nine percent of refining capacity. The economic opportunity to match extraction with manufacturing capacity has been decidedly forfeited.

Table 2.1 lists Canada’s refineries and upgraders, including information about location and capacity. The 17 refineries operating in Canada are controlled by 11 energy companies. Just three firms—Imperial Oil, Shell and Petro Canada—operate more than one refinery and market their products nationally. The other companies typically operate just one refinery and distribute their products regionally. There are three main refining centres in Canada—Edmonton, Sarnia and Montreal—but most provinces have at least one refinery. Manitoba, Prince Edward Island and the territories are the only regions with no refining capacity.

Not all refineries produce the full range of petroleum products. Husky’s facility in Lloydminster and the Moose Jaw Asphalt plant in Saskatchewan, for example, are primarily asphalt plants with limited production of other products. The Nova Chemicals facility in Sarnia, Ontario, is a petrochemical plant that also produces some distillate products.

The reasons for Canada's refining capacity stagnation are not hard to determine. The Canadian Association of Petroleum Producers (2016: Table 7.5a) reports that, between the early 1980s and the late 1990s (a period, like today, when oil prices fell by 70 percent) Canada closed 18 refineries—an average of one per year. In the process, Canada lost nearly 600,000 bpd of refining capacity. Since the onset of the energy boom, four more plants have closed, including the Petro Canada products plant in Oakville (in 2005), the Shell refinery in Montreal (2010), the Parkland Refining operation in Bowden, Alberta (2012) and the Imperial Oil facility in Dartmouth, Nova Scotia (2013).

Not only has Canada's refinery capacity shrunk, but in the six years since 2009, refinery utilization averaged 81 percent, while in the six years prior to 2009 utilization averaged 92 percent. Despite this, in 2012 Canada's total refined petroleum products amounted to 750 million barrels, or just over two million bpd. Regionally, Alberta is the largest refined petroleum products producer, with 28 percent of the total. Atlantic Canada and Ontario each account for 23 percent, Quebec produces 18 percent and the remaining eight percent is split between Saskatchewan and British Columbia. Petroleum manufacturing employs nearly 20,000 people, and a further 80,000 are employed in spinoff industries like plastic product manufacturing.

Table 2.1

Canadian Oil Refineries and Upgraders, 2013					
Location	Company	Capacity (000's bpd)	Location	Company	Capacity (000's bpd)
Come by Chance, NFLD	North Atlantic	115	Edmonton	Suncor	142
Saint John	Irving	320	Edmonton	Shell	100
Montreal	Suncor	137	Lloydminster, AB	Husky	82 (u)
Quebec City	Valero	265	Lloydminster, AB	Husky	29
Sarnia, ON	Imperial	121	Fort McMurray, AB	Syncrude	465 (u)
Sarnia, ON	Suncor	85	Fort McMurray, AB	Suncor	438 (u)
Sarnia, ON	Nova	80	Scotford, AB	Shell	240 (u)
Sarnia, ON	Shell	77	Fort McMurray, AB	CNRL	135 (u)
Nanticoke, ON	Imperial	112	Fort McMurray, AB	OPTI/Nexen	72 (u)
Regina	Co-op	135 (r/u)	Prince George, BC	Husky	12
Moose Jaw, SK	Moose Jaw	19	Vancouver	Chevron	55
Edmonton	Imperial	187			

Note: 'r' stands for refinery and 'u' for upgrader. Source: Canadian Association of Petroleum Producers.

2.5 Ownership, Revenue, Taxation

Apart from the responsibility to administer resources on Crown land, offshore resources and resources north of the 60th parallel, the federal government is charged with regulating interprovincial and international energy trade and energy infrastructure, nuclear energy and uranium. The actual ownership and management of energy resources falls under provincial jurisdiction (except those located on Aboriginal and federal land). Royalty design and collection are also provincial matters, as is electricity generation, distribution and regulation, and the laws and regulations governing exploration, development, conservation and energy usage. The federal and provincial tiers of government have joint responsibility for energy efficiency, environmental regulation of energy projects, scientific research and the development and management of offshore resources that fall under Accords.

In the postwar era, foreign ownership became a politically sensitive matter in Canada. Historically, Canada's corporate sector was dominated by foreign interests, first British then American. At one point in time Canada was the most heavily foreign-owned country in the advanced industrialized world. Since the mid-1990s, however,

Canadian business has owned more assets abroad than foreigners have owned in Canada—a dramatic break with the preceding century. Despite the recent reversal, foreign ownership remains relatively high in Canada, especially in the oil and gas industry.

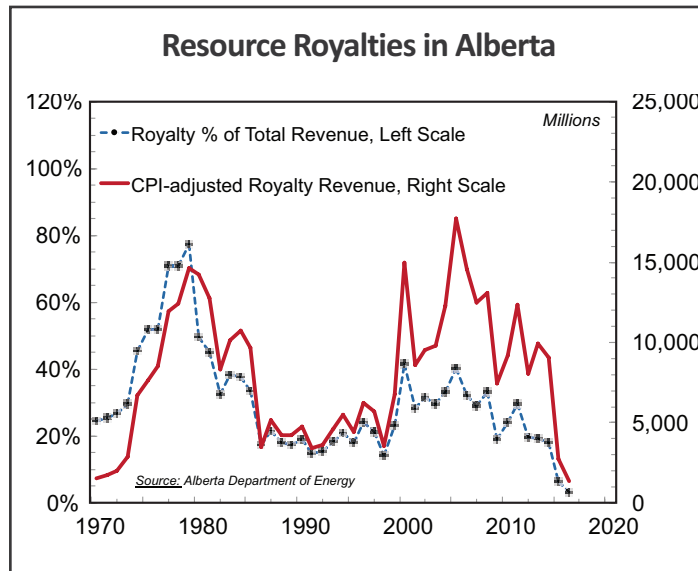
Across the Canadian corporate sector, nearly one-fifth of all assets and all operating profits are under foreign control. American-based firms are far and away the largest foreign owner, controlling roughly one-half of all foreign-owned assets. European-based firms own a further one-quarter. In the oil and gas industry the level of foreign ownership is roughly double what it is in the broader corporate sector. Nearly 40 percent of oil and gas assets are foreign-owned and more than one-quarter of oil and gas operating profits flow to foreign entities. Again, U.S.-based firms account for half of all foreign ownership.

Natural Resource Canada reports that, over the five years ending in 2013, the oil and gas industry contributed an average of \$23 billion per year in taxes, royalties and fees to government. Non-renewable resource royalties fluctuate heavily, given the tremendous volatility in base commodity prices. In Alberta, where most of Canada's oil and gas reserves are to be found, resource royalties are closely associated with energy prices. However, as a share of government revenue, royalty revenue has trended downward over the past 15 years, and that is despite the boom in energy prices (which reflects the fact that royalty rates have been reduced).



Figure 2.8 contrasts resource royalty revenues in Alberta, adjusted for inflation, and the royalty share of total government revenue. Royalty levels peaked in 2005 at \$17.7 billion dollars. However, as a share of government revenue, royalties in that year amounted to just 40 percent—far below the share seen in the late 1970s, when royalties were closer to 80 percent of government revenue. Between 2013 and

Figure 2.8



2016, royalty levels are set to plunge from \$10 billion to just \$1.4 billion. As a share of the Alberta government's total revenue, that represents a drop from 20 percent to just three percent.

As resource rich provincial governments have recently re-learned, there is a heavy price to pay in treating resource royalties like tax revenues. That strategy for resource development might look promising when prices are high and rising, but when the crash comes (as it inevitably does), the fiscal mess this causes becomes all too apparent.

The ten largest Canadian-listed firms in the oil and gas sector include Suncor Energy, Imperial Oil, Canadian Natural Resources, Enbridge, TransCanada, Husky Energy, Cenovus Energy, Crescent Point Energy, Encana and Talisman Energy.⁷ The ten largest TSX-listed oil and gas companies have, over the past decade, pulled in nearly \$1.5 trillion dollars in revenue, \$254 billion in pre-tax profit and have paid \$76 billion in corporate income taxes. Together they employed 55,000 workers across all their operations in 2013, which is astonishing given that the entire oil and gas industry directly and indirectly employed 350,000 people in that year (according to Natural Resources Canada). Other major foreign players include Shell (Netherlands), Total S.A. (France), Statoil (Norway), Chevron (U.S.), ConocoPhillips (U.S.), BP plc (Britain) and Nexen (formerly Canadian-owned, now controlled by Beijing-based CNOOC Ltd).

2.6 Economic Profile of Canadian Energy

Not only are Canada's energy reserves of global significance, but energy is a key source of Canadian prosperity. When examining the wider energy sector including such activities as oil and gas extraction, coal and other metal ore mining, electrical power generation, natural gas distribution, petroleum refineries, pipeline transportation and gasoline stations, we find that energy accounts for roughly 10 percent of Canadian GDP. This puts the broader energy sector on par with manufacturing in terms of its contribution to Canadian income. When we restrict the focus to core Unifor industries such as oil and gas extraction, petroleum refineries and natural gas distribution, the contribution to national



income amounts to roughly seven percent. This implies that oil and gas is on par with the other key industries such as finance and insurance, health care and education in terms of its contribution to GDP.

While the energy industry share of GDP is undeniably large, its share of overall business investment is even larger. In 2015, the oil and gas industry alone accounted for \$70 billion in fixed asset investment.⁸ Statistics Canada (2016: 7) reports that energy sector accounts for roughly one-quarter of total business investment. Fixed asset investment in Canadian oil and gas is forecast to plunge by \$50 billion between 2014 and 2016—from \$81 to \$31 billion—due to the slide in energy prices. On the consumer spending side of things, Statistics Canada also reports that the energy sector made up eight percent of Canadian household expenditure in 2013.

The energy industry is an important source of good-paying jobs. The average industrial wage (excluding overtime) in Canada in 2015 stood at roughly \$23 per hour, and the decade average annual growth rate of that wage was 2.6 percent. In natural gas distribution, average hourly earnings were \$36 per hour—a 57 percent premium over the national average—and wages in this sector have been growing by 3.6 percent per year over the past decade. In oil and gas extraction, the going wage is \$45 per hour—a 95 percent premium over the national average—and the decade average growth rate of that wage is 3.9 percent.

In the light of these facts, it's no wonder that provinces rich with energy resources tend to have average hourly wage rates above the national average. Wages in those provinces are not only higher, but they have tended to grow faster than the national average. Now, this doesn't mean that there aren't poorly-paid jobs in the energy industry. Downstream, gasoline station workers make \$14 per hour, on average. The higher wages upstream reflect a variety of factors, including the prevalence of skilled trades people, high barriers to entry—which restricts market access and enables workers to partake in the market power of oligopolistic firms—and importantly, union representation.

If the energy industry is outsized in terms of its contribution to GDP, investment and good-paying jobs, it is undersized in terms of employment. Table 2.2 outlines employment levels in some energy and energy-related industries. In 2015, approximately 250,000 people were directly employed in Canadian energy—down from 300,000 in 2014. This implies that just one-in-seventy Canadians work in energy industries. Roughly 90,000 people are directly employed in oil and gas extraction, with 90 percent of those people working in Alberta. A further 67,000 work in support activities for oil and gas extraction (two-thirds of them are in Alberta). The energy industry also employs: 9,000 in pipeline transportation; 14,500 in natural gas distribution; 78,000 in electric power generation, transmission and distribution; 16,600 in petroleum and coal product manufacturing, including refining; 15,000 in petroleum

Table 2.2

Employment in Energy-Related Industries, 2015		
Industry	Employment	% change from 2001
Oil & gas extraction	90,000	102%
Conventional O&G extraction	55,000	48%
Unconventional O&G extraction	34,000	390%
Natural gas distribution	14,500	-20%
Support activities for O&G	67,000	49%
Pipeline transportation*	9,000	49%
Petroleum refineries	11,000	70%
Petroleum manufacturing	5,000	21%
Petroleum wholesalers	15,000	-13%
Gasoline stations	85,000	11%
Basic chemical + resin manufacturing	18,000	-28%
Plastics manufacturing	81,000	-18%
Electric power	78,000	2%

Source: Cansim Table 383-0031.

wholesaling; and 85,000 in gasoline stations. Further down the supply chain, 18,000 work in basic chemical, resin and synthetic fibre manufacturing and 81,000 people are employed in plastics manufacturing.

Despite the fact that Canada is a net exporter of energy, it also heavily reliant on foreign sources to meet its energy needs. In 2014, energy consumption in Canada totalled 8.2 million terajoules. Canadian energy exports totalled 11.8 million terajoules—nearly 1.5 times what Canadians consumed. That same year, energy imports

totalled 3.3 million terajoules—40 percent of Canada’s total energy consumption. This reflects the fact that Canada’s energy grid is positioned on a north-south axis, not east-west. Western Canada sends the bulk of its energy south, while Central and Eastern Canada import energy from foreign suppliers to meet their needs.

In 2014, Canada exported 3.6 million barrels of oil per day, with 96 percent of that amount heading to the U.S. Most of the exported oil—rough 85 percent—was crude oil. The remaining 15 percent was petroleum products. In 2014, Canada exported 75 billion cubic metres of natural gas—11 percent of the global total—all headed to the U.S. In 2015, Canada’s oil and gas exports were valued at \$75 billion (15 percent of total domestic exports)—down from \$114 billion in 2014, before energy prices began to

slide. Petroleum and coal product exports were valued at \$18 billion, plastic products at \$10 billion and electric power at \$3 billion. Roughly 98 percent of Canada's energy exports are absorbed by the U.S. Even though Europe is the largest oil importer in the world (with 22 percent of the global total), on a country basis the U.S. is the largest importer of oil (with 16 percent of the global total).

Canada imports roughly 1.2 million barrels of oil per day, and in 2015 these imports were valued at nearly \$20 billion. The U.S. accounts for two-thirds of the total, with 10 percent coming from Saudi Arabia and five percent coming from each of Norway and Nigeria. Refined petroleum product imports reached \$13 billion in 2015, with three-quarters coming from the U.S., 10 percent coming from the Netherlands and the remaining 15 percent coming from dozens of other countries. Canada also imports 22 billion cubic metres of natural gas from the U.S.

Unifor has over 13,000 members working in Canadian energy, distributed across three sub-industries: natural gas distribution (36 percent of the total), oil and gas extraction (35 percent) and petroleum products (25 percent). An additional 500 members (four percent of the total) work in related energy occupations. Even though Unifor has 116 bargaining units in energy industries, one-third of the membership works for the largest Unifor employer, Suncor Energy. The five largest employers together—Suncor, SaskEnergy, Union Gas, Consumer's Co-op and Enbridge—account for 55 percent of total energy membership. Alberta hosts 36 percent of Unifor's energy membership, followed by the 25 percent in Ontario, the 19 percent in Saskatchewan, the seven percent in Quebec, the five percent in each of Newfoundland & Labrador and British Columbia and the three percent in Manitoba.



3. Canada's Energy Challenges

Because of the energy industry's uniquely important role in carbon emissions and petro-chemical pollution, and because energy infrastructure sprawls into the treaty and traditional territory of Aboriginal peoples, and because energy consumption (like food) is a non-negotiable activity—meaning it has a public good aspect to it—and because the energy industry constitutes a disproportionately large share of business investment (and thus overall economic performance), the Canadian energy industry is outsized in terms of policy significance and its political challenges.

Climate change (which will be addressed in Chapter 4), aging energy infrastructure, privatization, security of supply and import-dependence, Aboriginal land claims and socio-economic participation, maximizing economic activity and deepening industrial linkages up and down the supply chain, the transportation of hydrocarbons through pipelines, the commodity super-cycle, and macroeconomic regulation are a few of the more important energy challenges that Canada faces. Unifor has proposals for how to effectively solve these problems, which will be presented in Chapter 5. Before addressing this list of challenges, it is worth pausing to consider what experts predict in terms of future Canadian energy production, consumption and export.

3.1 Forecasts of Future Canadian Energy Production and Consumption

Despite the fact that the future is unknowable, and despite the fact that there are numerous variables which impact Canadian energy production and consumption, including market volatility, new technology, climate change mitigation strategies and international politics, to name a few, the National Energy Board (NEB hereafter) forecasts steady increases in Canadian energy production, consumption



and exports in the coming decades. The NEB (2016a: 1) projects that end-use energy demand will track overall GDP growth, but primary energy production and exports will grow faster than energy usage.

Between 2014 and 2030, end-use energy demand will increase by 17 percent. The fastest growth will be in the commercial and industrial sectors, which will see average annual growth rates of 1 percent and 0.9 percent,

respectively. Residential and transportation energy usage will grow, the NEB continues, albeit at far slower rates—0.3 percent per year and 0.2 percent per year, respectively, on average (NEB 2016b: 37). In terms of primary energy production, the fastest growth will be in crude oil—specifically the oil sands—which the NEB forecasts will grow by nearly 50 percent between 2014 and 2030. Conventional (light and heavy) oil production is forecasted to shrink over that period. Natural gas production is

projected to increase by 20 percent between 2014 and 2025, at which time growth effectively ceases. By 2030, natural gas liquids (NGLs) production is forecasted to have increased by 28 percent.

The NEB (2016b: 37) estimates that electricity generation and capacity will both increase by 16 percent between 2014 and 2030, with the fastest growth coming from solar (235 percent increase), wind (100 percent increase) and natural gas (60 percent increase). In 2030, hydro will remain the most important source of electricity generation, accounting for 52 percent of overall capacity, but it will only grow by 12 percent between 2014 and 2030, says the NEB. Coal, oil, and nuclear-based electricity are expected to shrink in significance in the coming decades.

Energy production is heavily dependent upon energy prices, but in all forecasted price scenarios energy production increases. Even in the absence of new oil pipeline infrastructure, which means more crude will travel by rail (and thus fetch a lower price because of the net increase in transportation costs), the NEB predicts that crude oil production will increase (2016a: 5).

Energy intensity, measured as usage per unit of economic activity, continues its declining trend. However, the NEB forecasts that fossil fuels will remain the primary energy source in Canada in 2030 (2016a: 7). Importantly, the NEB (2016b: 21) forecasts increases in GHG emissions, which is not surprising given the close linkages between fossil fuel consumption and carbon emissions.

Challenge #1: If fossil fuel production and consumption are forecasted to increase in the coming decades (despite decreases in emissions intensity), and if GHG emissions will increase in conjunction with greater fossil fuel usage, it is unclear if Canada will be able to meet the emission-reduction commitments it made at the COP 21 in Paris (the ‘Paris Agreement’)?

3.2 Aging Infrastructure

Much of Canada’s oil and gas pipeline infrastructure was built in the 1940s and 1950s. Explosive growth in oil production has called into question the adequacy of Canada’s oil pipeline infrastructure. Likewise, Canada’s electricity infrastructure is aging. Ontario, for example, has one of the oldest electricity systems in the world and 15 percent of Manitoba Hydro’s transmission lines have been in use for more than 50 years. There are also limitations in interprovincial transmission capacity, which reduces overall system efficiency.

Inadequate infrastructure is not a universal problem in Canadian energy. Canadian natural gas production increased significantly in the 1990s, peaked in 2006 and has since declined by 13 percent, as newer wells have tended to be less productive than those previously drilled. The NEB (2009: 16) reports that, owing to a decrease in output, existing natural gas pipeline and processing infrastructure has adequate capacity. Canada’s long-haul infrastructure capacity from western Canada, where 97 percent of Canadian natural gas is harvested, is well-connected to consuming regions in eastern Canada.

Additional infrastructure may be needed to address the growing demand for gas-fired power generation in eastern Canada and growing shale gas supply, but the spread between domestic production and consumption is sufficiently large to make these infrastructure needs ‘hypothetical’.

According to the NEB (2009: 22), an extensive infrastructure network has evolved in Alberta, British Columbia and Saskatchewan to assemble, fractionate, store and distribute NGLs—ethane, propane, butane, pentane and heavier hydrocarbons—with underground storage facilities sprinkled in a half dozen locations between Alberta, Saskatchewan and Ontario. Ethane is at the centre of Alberta’s petrochemical industry, and the industrial significance of condensate—which is used as a diluent in transporting oil sands and conventional heavy oil—has grown in recent times. NGLs move through pipeline and in trains between the major hubs (Edmonton and Sarnia) and consumer markets in eastern Canada and the U.S. The NEB claims that new infrastructure will be required to meet the growth in demand for ethane and condensate in western Canada, including ethane production facilities, interprovincial NGL pipelines and storage and distribution facilities.

Challenge #2: Canada’s NGL industry will require new production, pipeline, storage and distribution facilities to meet forecasted growth in ethane and condensate production.

Canadian electricity generation, transmission and distribution is regulated provincially, save for export permits and inter-provincial power lines (IPLs). The NEB (2009: 29) states that electricity transmission nearly doubled after restructuring in the mid-1990s, with U.S. imports increasing in provinces like Ontario, B.C. and Alberta due to consumer demand outpacing supply. Aging infrastructure, reliability of supply and competitive prices are important issues for Canadian electricity.

The NEB (2009: 31) states that recent decades have seen little in the way of investment in Canadian electricity transmission. A recent survey conducted by the Canadian Electricity Association finds that inadequate infrastructure is the most significant issue facing the electricity industry. Between 2005 and 2030, the International Energy Agency estimates that \$190 billion (\$US dollars) will be needed to modernize Canada’s electricity system, with 60 percent of that amount earmarked for generation and transmission infrastructure (NEB 2009: 29).

Challenge #3: Much of Canada’s electricity system is aging and is in need of heavy investment over long spans of time. Above-average electricity prices in some provinces are a competitive disadvantage for energy-intensive trade-exposed industries (advanced manufacturing, for example). Inadequate east-west connectivity impairs overall system efficiency and compels regions lacking access to non-emitting power sources to rely on fossil fuels for electricity generation.

In terms of solutions to electricity infrastructure, greater integration of the North American grid, especially east-west connectedness, is one way to go, says the NEB (2009). Provinces with abundant hydroelectric capacity, such as Quebec, Ontario, Manitoba and B.C. have the advantage of being able to

vary output in response to fluctuations in demand while storing energy in the form of water behind dams. The NEB (2009: 29-30) claims that provinces with nuclear baseloads, such as Ontario and New Brunswick, have less flexibility to respond to large fluctuations in power demand, but the combination of a system with excess base load in off-peak times with a system abundant in hydroelectricity increases overall efficiency.

The creation of a 'smart grid' is another potential solution. According to the NEB (2009: 32), a smart grid increases the connectivity of a system by forging stronger linkages between suppliers, consumers and distribution networks. The 'smart' in 'smart grid' is an intelligent real-time system that uses sensing and monitoring technologies to enhance the flexibility, reliability and efficiency of the grid.

New transmission infrastructure, including IPLs, will also be needed to better integrate renewable sources of power into the Canadian grid, such as wind, solar and biomass. Areas abundant in wind resources, for example, are often at a distance from consumer markets. And some consumer markets are sufficiently remote that they remain dependent upon fossil fuels for electricity generation (the Territories, PEI and New Brunswick, for example). By connecting renewable power generation regions with regions that are currently dependent upon fossil fuels, Canada can increase the market for renewable energy while reducing GHG emissions. An example of constructive energy federalism, as it might be called, is to be found among the governments of Alberta and British Columbia, which are discussing the possibility that Alberta purchase electricity from B.C. (potentially from the new \$8 billion Site C dam in northeastern B.C.), which would help Alberta reduce the soaring GHG emissions associating with bitumen mega-developments (see Mason 2016).

3.3 Regulation and Privatization

Privatization is the act of transferring ownership, through sale, from a government (the public) to private business. Privatization is often advanced (and justified) by the presupposition that business is better able to manage an enterprise than public officials. Owing to the profit motive and other competitive pressures, private owners have the incentive to reduce costs and enhance overall enterprise efficiency, says the pro-privatization camp.

From a labour perspective, privatization often means downsizing of the workforce, reduced compensation, intensification of work and a worsening of working conditions. While these workplace changes may enrich proprietors, they may make life more difficult for workers. Private owners have an incentive to increase the sales price of the commodities sold, again, because of the profit motive. Privately run enterprises also have an incentive to reduce the quantity and quality of unprofitable services, even if those services are valued by the communities that receive them. For these reasons—downward pressure on wages and benefits, intensification of work, worsening of working conditions, increased prices and reductions in service delivery—many labour unions and other stakeholders oppose privatization in principle.

Although privatization has been a part of Canadian energy politics since the 1970s—the Lougheed Government privatized the Alberta Energy Company in 1975—much of the privatization push, both provincially and federally, came in the 1980s and 1990s. A partial listing of major privatizations is presented in Table 3.1.

The enthusiasm for privatization seemed to be based, in part, on political amnesia. Despite what we’re constantly told, private business does not thrive on risk. Provincial and federal governments often created Crown corporations in the energy industry to perform activities that private business was unwilling to do. For example, Petro-Canada engaged in extensive exploratory activities in Canada’s north and it poured resources into the research and development of synthetic fuels. These activities were both risky and unprofitable (at least in the short term), despite being necessary for long-term industrial development.

Table 3.1

Major Privatizations in Canadian Energy			
Date	Company	Sector	Former Owner
1975	Alberta Energy Company	Oil and gas	Government of Alberta
1986	Saskatchewan Oil and Gas	Oil and gas	Government of Saskatchewan
1987	SOQUIP Alberta	Oil and gas	Government of Quebec
1987	Northern Canada Power Commission	Electric utility	Government of Canada
1988	SaskPower’s oil & gas unit	Oil and gas	Saskatchewan Oil and Gas
1988	B.C. Hydro: mainland natural gas division	Natural gas distribution	Government of British Columbia
1991	Petro-Canada	Oil and gas	Government of Canada
1992	Suncor	Oil and gas	Equity stake: Federal Government
1992	Nova Scotia Power Corp	Electricity generation	Government of Nova Scotia
1993	Syncrude Canada	Oil and gas	Equity stake: Federal Government
2002	Ontario Power: Four hydroelectric stations	Electricity generation	Government of Ontario
2011	AECL: commercial division	Nuclear power	Government of Canada
2015-	Hydro One: 60% equity	Electricity generation	Government of Ontario

Source: Boardman and Vining (2012), Tables 1-2, pp. 4-5.

There are other advantages to public ownership. For starters, resource development can be actively managed in accordance with other goals such as pollution-mitigation and GHG reduction. And with a government equity stake, the public directly captures a portion of the financial windfall associated with energy mega-projects. An additional benefit to public ownership is the maintenance of employment levels during a recession. For private enterprise, when a price shock is experienced one of the first responses is to shed employment in an effort to reduce costs. The social consequences are very damaging. Publicly-owned enterprises, on the contrary, can deliberately run at a loss during a downturn, knowing that income can be replaced during the expansion. The major shortcoming with

private enterprise (though there are many beneficial aspects) is that economic activity is only permitted to take place if corporations and their owners receive an ‘adequate’ return on investment. Industrial development and job creation will only take place if owners can turn a ‘reasonable’ profit.

While early privatization efforts tended to centre on crown corporations in the oil and gas industry, Petro-Canada and Suncor being prime examples, more recent privatizations have been in the partial sale of electricity utilities. In 2014 an advisory panel recommended that the Wynne Liberals privatize a portion of Hydro One, the government-owned electricity agency that handles nearly all of Ontario’s electricity transmission, in addition to local distribution to more than one million customers. The estimated value of Hydro One is \$15 to \$16 billion, and the Wynne Government plans to use a portion of the proceeds to finance its public transit investments (the rest will pay off public debt). The Ontario government began by selling 15 percent of Hydro One on the Toronto Stock exchange, with future plans to sell an additional 45 percent. The total proceeds are expected to reach \$9 billion.



Opponents of the privatization include Unifor, CUPE, the Ontario NDP and even the Ontario Progressive Conservatives. The fear is that the new owners will demand that the Ontario Energy Board increase rates on households and that the newly privatized firm will reduce the quantity and quality of service. These fears are well-founded. The province’s own Financial Accountability Office has stated that the sale will cost the provincial treasury more in the way of forgone dividends than it gains from the sale—upwards of \$500 million per year in lost revenue—and will worsen the government’s overall fiscal situation. In the FAO’s words:

In years following the sale of 60 per cent of Hydro One, the Province’s budget balance would be worse than it would have been without the sale... The Province’s net debt would initially be reduced, but will eventually be higher than it would have been without the sale (Financial Accountability Office of Ontario 2015: 1).

Beyond the questionable math, Unifor fears that privatization could spell higher electricity prices for consumers, who are already coping with soaring utility bills and other energy costs amidst stagnating wage growth. And with profit now in the picture, there is less motivation for Hydro One to quickly restore power after outages or replace outworn equipment. Rural areas, which are generally more costly to serve, could see reductions in service quality.

Then there is the question of oversight. Hydro One is currently subject to the Auditor General, the Ontario Ombudsman and other public watchdogs (see Morrow 2015). The partial sale of Hydro One also deprives future governments of vital revenue sources at a time when population aging and increased health care costs are straining public finances. For these and other reasons, Unifor opposes the privatization of energy enterprises and operators.

Challenge #4: The on-going privatization of Canadian energy assets undermines several policy goals, including public oversight, infrastructure maintenance, employment levels, cost efficiency and fiscal effects, among others.

3.4 Security of Supply and Import-Dependence

In 2015, Canadian oil production and consumption reached 4.4 million bpd and 2.3 million bpd, respectively. Despite the fact that Canada produces nearly twice as much crude oil as it consumes, oil imports were just shy of 1.3 million bpd in 2015 (roughly split between crude and product imports), while exports topped 3.8 million bpd (roughly 85 percent of which was unrefined crude oil). While western Canada is awash in oil, eastern Canada is dependent upon foreign suppliers, mainly American, but also suppliers from the Middle East, North Africa, West Africa and Europe. Likewise for natural gas: Canada produced 60 percent more natural gas than it consumed in 2015. Despite the imbalance between production and consumption, Canada imported nearly 20 billion cubic metres (bcm) in natural gas from the United States—nearly 20 percent of total consumption.

Fear of energy insecurity haunted Canadians of previous generations. The petro politics of the 1970s saw OPEC countries restrict energy supply to Western countries as punishment for the latter's support for Israel in the Arab-Israeli War of 1973—an act which succeeded in striking fear into the hearts of the Canadian public. There was a time in the not too distant past when oil imports accounted for 90 percent of Atlantic Canada's and Quebec's consumption, and 30 percent of Ontario's consumption. Politically volatile countries like Iraq, Algeria and Saudi Arabia seemed like unreliable trading partners. Talk of 'peak oil' in the 2000s also convinced many people that the world was running out of fossil fuels and that measures were needed to ensure security of supply.

Despite these historical circumstances, recent developments have called into question the notion that the world is running out of fossil fuels, or that Canada's energy trading partners are unreliable. For starters, shale and fracking technologies have led to a revolution in U.S. energy production. Between 1970 and 2008, U.S. oil production contracted by one percent per year, on average. Between 2008 and 2015, U.S. oil production soared by nearly 10 percent per year, on average. In 2014 the U.S. eclipsed Saudi Arabia as the world's top global producer. And global reserves, which were once thought to have 'peaked', have continued to climb despite dire predictions to the contrary. In 2015 the U.S. lifted its four decade-long ban on crude oil exports. As a result, 65 percent of Canada's crude imports and 85 percent of its product imports come from the U.S. All of Canada's natural gas imports are of U.S. origin.

There are four main impediments in altering Canada's import-dependence and ensuring supply of Canadian oil and gas resources for Atlantic and eastern Canada. The first is inadequate pipeline capacity, which fails to connect the producing regions of western Canada with consumer markets in Ontario, Quebec and Atlantic Canada. The second is inadequate refining capacity. Canada imported more than

600,000 bpd of refined petroleum products in 2015. Even if Canada's refineries ran at 100 percent of capacity (up from the current 87 percent), Canada would still need to import refined product.

The third impediment is NAFTA's 'proportionality clause', which requires Canada to export a steady proportion of total production to the U.S., even if Canada were to experience a domestic shortage. A fourth impediment, and potentially the greatest of all, is the sheer fact that the world is awash in cheap oil and natural gas. And given that Canada's energy infrastructure is fully integrated into a North American energy system, the economics associated with north-south regional energy links may make it more economic for eastern Canada to import energy resources from the north-eastern U.S. while western Canada exports oil and gas to the U.S. Midwest and Gulf Coast.

Challenge #5: Refineries in Eastern Canada are dependent upon crude from foreign suppliers. Inadequate east-west pipeline capacity has meant that refiners, petro-chemical manufacturers and consumers in Eastern Canada are dependent upon foreign crude oil, despite the huge production surpluses Canada runs. This import-dependence and insecure supply weakens economic linkages in Canada and fails to fully utilize the industrial potential of Canada's energy resources.

3.5 Aboriginal Consultation and Full Socio-Economic Participation

The Royal Proclamation of 1763—issued by King George III after the Seven Years War, in which Britain dispossessed France of much of her colonial holdings in North America—forms the basis of modern Indigenous land claims. The proclamation is cited in Section 25 of the Canadian Charter of Rights and Freedoms, and in so doing, it establishes that First Nations, Inuit and Metis peoples possess treaty rights. Despite having rights enshrined in Canadian law, Aboriginal peoples have historically been excluded from the planning, implementation and the economic activity associated with natural resource development, even projects on treaty lands.

It has long been known that there is a significant gap between the well-being of Indigenous and non-Indigenous Canadians. Assembly of First Nations Chief Perry Bellegarde claims that while Canada ranks eighth on the United Nations human development index—a global measure of living standards—if the indicators used for the index were applied to Indigenous Canadians they would rank 63rd on the list. The failure to properly and meaningfully consult Aboriginal people about resource development on their treaty lands and the exclusion of Aboriginal people from the economic benefit of resource development is just one (of many) unjust practices that Canada must rectify.

A number of high profile Supreme Court of Canada (SCC) decisions, in conjunction with the *United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)*, have begun to change the relationship between the Crown and Aboriginal peoples. The *Haida Nation v British Columbia (2004)* decision established the 'duty to consult and accommodate'. The SCC ruled that the Crown has an

obligation to consult Aboriginal peoples when an action or decision affects Aboriginal or Treaty rights, which often applies to natural resource development. In *Tsilhqot'in Nation v. British Columbia* (2014), the SCC recognized the Tsilhqot'in's title claim to a 1,750 square kilometre tract of non-reserve territory. This is significant, in part, because it means that Aboriginal title to traditional territory includes the right to control all aspects of land utilisation, including resource development. Furthermore, this control is almost entirely free from government jurisdiction.

In a similar vein, the 2007 passage of the UNDRIP in the UN General Assembly marked the culmination of a quarter-century-long struggle by Indigenous scholars and activists. The *Declaration* was endorsed by the Government of Canada in 2010, despite the fact that Canada and other former British colonies voted against the *Declaration* in 2007 because of its articles on self-determination and resource development. When Prime Minister Harper endorsed the UNDRIP in 2010, he emphasized the 'aspirational' aspect of the document, and its non-legally binding status. The Trudeau Government reversed course in May of 2016, when it announced that it would 'fully adopt' the *Declaration* and 'implement it with the laws of Canada' (see Favel and Coates 2016 for a concise overview).

The UNDRIP is a far-reaching document containing principles which would begin to reconcile Indigenous peoples with the former colonies and contemporary States that emerged in the (so-called) New World. For Canada, the more controversial elements of the UNDRIP include language around resource development. For example, Article 19 states:

States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their *free, prior and informed consent* before adopting and implementing legislative or administrative measures that may affect them (UNDRIP: 2007, emphasis added).

That term, 'free, prior and informed consent', raises important questions. When considering the SCC decision around the duty to consult, does consultation imply approval? And does approval imply the power to veto resource development on treaty lands? At the present time these questions remain unanswered. And yet for moral and practical reasons a return to the old status quo—when government's and resource companies could ignore Aboriginal peoples, exclude them from decision-making and cut them off from the economic benefit of resource development—would be unwise.

The aforementioned SCC decisions in conjunction with the UNDRIP make it imperative that Canada reconfigure the process for evaluating, approving, implementing and managing natural resource development projects. Canada has a moral obligation to improve the condition of Aboriginal peoples, it has the legal obligation to consult and accommodate them about resource development on their treaty lands, and there is a political duty to ensure that Aboriginal peoples are equitable benefactors of

resource development, including measures around skills development, employment opportunities, managerial oversight and ownership stakes.

Challenge #6: Canada must find a way to harmonize the moral, political and legal obligations it has to Aboriginal people vis-à-vis natural resource development on treaty lands.

3.6 Canadian Energy Resources: Maximizing Economic Activity

Canada produced nearly 4.4 million barrels of oil per day in 2015, up 60 percent from 2001. Canadian refining capacity was just shy of 2 million bpd—less than half of production. Net refining capacity in Canada has remained largely unchanged over the past 15 years, despite the fact that oil production has soared and despite the fact that four refineries have been shuttered. Soaring oil production amidst stagnant refining capacity is made all the worse when we learn that refinery throughputs contracted by 10 percent since 2005, having declined from 1.9 to 1.7 million bpd. In 2015, Canadian refineries were operating at 87 percent capacity. Even if Canadian refineries ran at full capacity, Canadian consumption (2.3 million bpd) would exceed refining capacity by 350,000 bpd, or 20 percent.

The imbalance between extraction and manufacture is also evident in Canada's oil trade performance. In 2015 Canada exported 3.8 million bpd of oil, only 16 percent of which was petroleum products; the remaining 84 percent was unprocessed crude. On the import side, Canada purchased 1.3 million bpd from abroad, nearly *half* of which was petroleum products. In effect, Canada sells unprocessed crude to the world, namely the U.S., and repurchases the refined product. Canada's orientation toward raw material



extraction to the detriment of upgrading, refining and petro-chemical manufacture has been long understood (see Stanford 2008), but it has a substantial and negative impact on economic opportunity.

Contrast the two options open to Canada: export raw bitumen abroad via pipeline (the 'extractivist' approach) or utilize crude oil production as a basis for job creation (the 'industrial linkage' approach). Whereas some 90,000 people are employed in oil and gas extraction, fewer than 17,000 are employed in upgrading, refining

and petroleum manufacture. The differences in the rate of growth of employment between extraction and upgrading are also wildly unbalanced. Between 2001 and 2015, employment in oil sands extraction increased by nearly 400 percent, while upgrading, refining and manufacture increased by just 50 percent. Similarly, employment in oil pipeline transportation increased by nearly 150 percent between 2001 and 2015 to accommodate the huge increase in extraction, but further down the supply chain we find that employment in chemical manufacturing and plastic product manufacturing *decreased* by 28 percent and 18 percent, respectively.

Challenge #7: There is a heavy infrastructure imbalance between upstream oil production, on the one hand, and midstream upgrading, refining and manufacturing capacity, on the other. This imbalance translates into industrial under-utilization and fewer employment opportunities. The failure to upgrade, refine and manufacture Canadian petroleum resources means less investment, fewer jobs, higher levels of petroleum product imports (which worsen Canada's trade deficit), a smaller tax base and squandered economic opportunity.

Challenge #8: The Canadian commitment to forge tight linkages between oil extraction and export pipelines has meant that industrial linkages down the supply chain, including secondary manufacture of petro-chemical and plastic products have been insufficiently developed.

3.7 Transporting Oil and Natural Gas

Canada produced nearly 4.4 million barrels of oil per day in 2015, the bulk of which was transported through pipeline.⁹ The NEB estimates that nearly one million bpd moved along Canada's rail network. A small portion of crude, namely that produced offshore, was transported in tankers. Pipelines are an important part of Canada's energy infrastructure. There are tens of thousands of kilometres of energy pipelines in Canada, linking production fields, processing facilities, distribution networks and final consumers. Pipelines are a relatively safe and efficient means for transporting petroleum and natural gas. The construction of a national grid of pipelines was an important contributor to our national development—much like building the TransCanada Highway or the St. Lawrence Seaway. And like other infrastructure investments, pipelines can generate important economic benefits from their construction and operation.

Of course, pipelines (like any other mode of transportation) must be carefully regulated, with special ongoing attention to safety and security. Pipeline companies must face constant oversight, to ensure the safe and reliable operation of their facilities, ongoing maintenance, rapid response to accidents and spills and fair pricing for consumers (given their often near-monopoly powers in specific markets). The construction and operation of pipelines must also be preconditioned on acceptable agreements with First Nations and other communities affected by the pipelines.

Intense debates have erupted in Canada, the U.S. and elsewhere regarding industry proposals for enormous new petroleum pipelines. These proposals have been motivated mostly by the significant and unplanned expansion of bitumen production in northern Alberta. Historically, short-sighted thinking by the federal and Alberta governments allowed many large new bitumen projects to be constructed without addressing the many infrastructure needs associated with that boom—including transportation, housing and social infrastructure. The industry also neglected to imagine how all that new production would be delivered to final purchasers. Unfortunately, most of their intended customers are outside of Canada. The bulk export of raw bitumen dramatically undermines the potential economic benefits of this industry to Canadians.

The NEB (2009: 8-9) reports that between 2005 and 2010, crude oil pipeline projects tended to focus on U.S. Midwest. After 2010, new pipeline proposals targeted the U.S. Gulf Coast and the west coast of Canada to California or Asia. In response to increased shipments from Canada, U.S. refineries have undergone conversion to handle the processing of bitumen. Because many of the largest firms in Canadian energy are fully integrated multinationals, they can view Canada as a source of upstream supply while retaining midstream and downstream facilities in the U.S. In other words, Canada is simply the point of extraction, with upgrading, processing and distribution happening elsewhere. These infrastructure and ownership facts mean that Canada is not maximizing the economic activity arising from its crude oil resources. There have been a number of major export pipeline proposals in recent years, including:

Enbridge Line 67. The ‘Alberta Clipper’, as it is known, is a heavy crude oil export pipeline running from Hardisty, Alberta to Superior, Wisconsin. The 1,600 km pipeline initially had the capacity to transport 450,000 bpd when it first came online in 2010. In 2013, Enbridge applied for an expansion of the project that would have seen capacity grow to 800,000 bpd. The former CEP opposed it.

Enbridge Line 9B Reversal. The Enbridge Line 9 project involved renovating and reversing a 650km section of the existing Line 9 pipeline, which carried imported oil from North Africa and the Middle East to refineries in Ontario. The capacity of the pipeline was also expanded by 60,000 bpd (to 300,000 bpd). The reversed pipeline supplies oil to two Quebec refineries, thus helping ensure the industrial viability of Quebec’s refining and petrochemical manufacturing industries. The Line 9 pipeline was initially built in the 1970s to carry Western petroleum to Eastern Canada, when the oil industry was federally regulated. The flow was reversed (to run east to west) in the wake of the post-NAFTA diversion of most Western Canadian output to the U.S. market. The former CEP supported the Line 9 project because it was consistent with several aspects of its vision for a regulated, made-in-Canada energy industry:

- It strengthened the east-west energy grid in Canada, matching Canadian energy supply with Canadian energy consumption;
- It displaced petroleum imports to eastern Canada which have their own environmental consequences, including pollution associated with trans-ocean tanker shipping;
- It secured the viability of two refineries in Quebec. Several refineries in Canada have closed in recent years, despite the expansion of our own petroleum production. Securing the ones that are left was an important priority for our efforts to strengthen industrial linkages up and down the energy supply chain, including secondary manufacturing.

Keystone XL. This export pipeline proposal would extend TransCanada’s existing Keystone Pipeline System, which connects the Western Canadian Sedimentary Basin in Alberta with refineries in Illinois and Texas and with oil tank farms and a distribution centre in Cushing, Oklahoma. The ‘XL’ portion of the pipeline

system would have been the fourth phase of the Keystone Pipeline System. The first three phases of the system, which are currently operational, have the capacity to deliver 1.3 million bpd from the Alberta oil sands to refineries in the Midwest and Gulf Coast. The project was approved by the Harper Government. In November of 2015, after a six year review period, President Obama rejected Keystone XL, which would have added 830,000 bpd of export capacity. The former CEP and CAW opposed it.

Northern Gateway. Enbridge's proposed twin pipeline would have linked Bruderheim, Alberta to Kitimat, British Columbia. The eastbound portion of the pipeline would have imported natural gas condensate while the westbound pipeline would have exported diluted bitumen to the marine terminal in Kitimat for export to Asian markets. This 525,000 bpd increase in export capacity was approved by the Harper Government (and the National Energy Board) in June 2014, which had been subject to 209 conditions. However the Federal Court of Appeal overturned the approval in June 2016 because of the failure to adequately consult affected First Nations. Because of Prime Minister Trudeau's ban on oil tanker traffic along the northern coast of British Columbia, the project was already in jeopardy. The former CEP and CAW opposed it.

TransMountain Expansion. Formally proposed to regulators by Kinder Morgan in late 2013, this twinned 900 km pipeline expansion between Edmonton, Alberta and Burnaby, British Columbia would add 590,000 bpd to current oil pipeline capacity (for a total of 890,000 bpd), mostly for export. In May of 2016, the NEB approved the pipeline, subject to 157 conditions (including 49 environmental requirements). In the NEB's judgement, the expansion provides several economic advantages, including increased access to export markets, thousands of construction jobs and increased government revenue. At this point, the exact route of the pipeline is still not determined. The federal government has until the end of 2016 to make a decision on the project. Factors that will affect the federal government's decision include the upstream GHG emissions and views of First Nations and other communities along the route. The former CEP opposed it, and also called for special allocation of supply to Chevron's Burnaby refinery, which was rejected by the NEB.

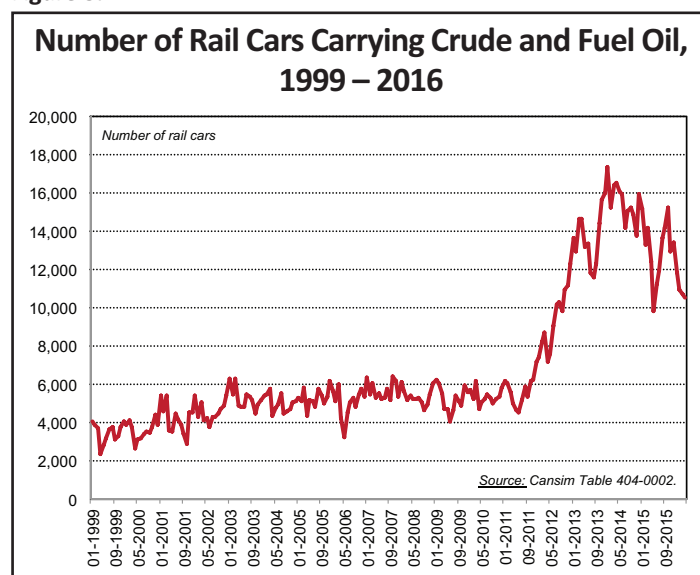
Energy East. In 2014 TransCanada formally proposed a \$12 billion, 4,600km pipeline that would carry 1.1 million bpd of crude oil from Alberta, Saskatchewan and North Dakota to refineries and port terminals in Montreal, Quebec City and Saint John. Irving Oil announced plans to build a new \$300 million dollar terminal at its Canaport facility in Saint John to export the oil processed at its refinery. The TransCanada project would include: the conversion of an existing natural gas pipeline to an oil transportation pipeline; construction of new pipeline in Alberta, Saskatchewan, Manitoba, Ontario, Québec and New Brunswick to link up with the converted pipe; and construction of the associated facilities, pump stations and tank terminals required to move crude oil from Alberta to Québec and New Brunswick, including marine facilities that would enable access to export markets. Controversy around Energy East includes Aboriginal opposition (the pipeline would run through the territory of 180 Indigenous groups), the upstream GHG emissions associated with the project, which may make

Canada's climate commitments unattainable, and the impact that increased tanker traffic would have on sensitive marine habitat. Provincial governments in Alberta, Saskatchewan and New Brunswick support the project. The governments of Ontario and Quebec have imposed approval conditions. Unifor has yet to take a stand on the project.

Challenge #9: Most of these massive new export pipelines (if approved) would cement Canada's status as a supplier of raw energy to the U.S. and other global customers, exacerbate the overvaluation of the Canadian currency, contribute to increased GHG emissions at a time when Canada needs to alter its carbon trajectory and reinforce the short-sighted trajectory of the whole energy industry.

Challenge #10: The Energy East pipeline proposal has the potential to meet important Unifor conditions, including strengthening east-west energy connectivity, refining and petro-chemical manufacture. However, more information is needed around export volumes, the GHG emissions associated with elevated levels of extraction and Aboriginal consultation and participation before Unifor can pass judgement on the proposal.

Figure 3.1



Opposition to pipeline expansion has been strong north and south of the Canada-U.S. border, however the assumption that opposition activism has either slowed the growth of oil sands production or reduced the transport of Alberta oil is not borne out by the facts. Oil sands production has continued to grow at a rapid clip, despite staunch opposition. What's more, the failure of the energy industry to secure new pipeline infrastructure has not halted the transportation of Alberta crude. Rather, there has been a surge in the

transportation of oil by rail. Rail also transports jet fuel, propane, radioactive materials, ammonium hydroxide and other dangerous commodities without catastrophic incident.

Figure 3.1 captures this trend by plotting the number of rail cars carrying crude or fuel oil in Canada on a monthly basis. Between 2003 and 2010, rail traffic averaged four to six thousand cars per month. Between the summer of 2011 and the winter of 2014, the number of cars carrying oil nearly quadrupled. The diversion of oil from pipelines to railways does not reduce GHG emissions, but it does have the capacity to create an alternative set of problems.

The Lac Megantic tragedy, in which 47 people lost their lives after a freight train carrying crude oil derailed in the small Quebec town, alerted Canadians to the lethal risks associated with rail transport. One side of this issue was the commodity being transported, namely oil, but the other side of the issue was the container itself. Many assumed that the tank car used to transport oil—the DOT 111—was safe, even though industry observers had long noted that it wasn't. The new DOT 117 car has better thermal protection and has been deemed superior by industry insiders in safety terms.

A recent study found that while the transportation of oil by rail and by pipeline are both relatively safe, when the two transport modes are compared rail is 4.5 times more likely to generate a negative occurrence.¹⁰ This conclusion is by no means universal. Another study out of the Massachusetts Institute of Technology found that, generally speaking, pipelines have fewer incidents than rail, but the magnitude of the pipeline spill tends much larger when pipelines are used.¹¹ That same study found that GHG emissions tend to be lower among pipeline transport. However, when the power grid relies on fossil fuels, emissions might actually be lower when rail is relied upon. It is for this and other reasons that the Pembina Institute (see Lemphers 2013) argues that more research is needed to effectively compare the relative safety of the two transport options.

Yet another problem is the elevated cost associated with rail, which may reduce the earnings margins energy firms receive on their product. In theory, lower margins may translate into reduced investment, lower levels of job creation and less expenditure on R&D into emissions reductions technologies.

Challenge #11: The transport of oil by pipeline and by rail poses numerous challenges in terms of public safety, GHG emissions and economic efficiency. Given the weight of the evidence, pipelines seem the better option in terms of community safety, carbon pollution and transportation costs. Despite the apparent superiority of pipeline over rail, Unifor believes that vigilant monitoring by federal and provincial regulatory bodies is needed to ensure that the risks to human and ecological health are minimized.

Fracking. More dramatic changes in the energy industry have been unleashed by the rapid expansion of hydraulic fracturing or 'fracking'. This technology allows for the extraction of previously unrecoverable reserves of natural gas and oil from shale and other dense geological formations. Various forms of fracking (in which production is enhanced, for a short period anyway, through the high-pressure injection of water and chemicals into wells) have been in use by the petroleum industry for decades. However, unconventional new techniques have been applied to previously unviable pools of oil and gas such as North Dakota's Bakken shale field, where production has exploded in the past decade.

This has had dramatic effects on energy markets (especially for natural gas), but has also had enormous environmental consequences, including huge GHG emissions from methane and flared gas, poor water quality, destruction of land through super-intensive drilling, local earthquakes and more. Energy firms

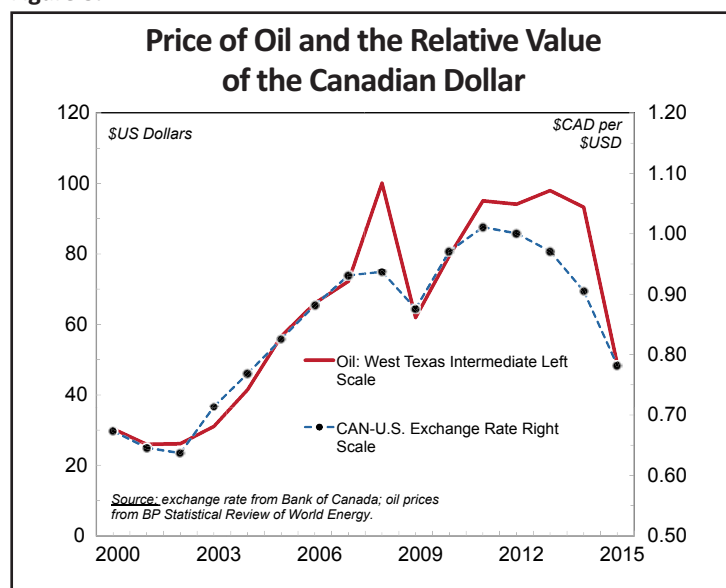
have now turned their attention to other possible Canadian shale petroleum regions, including locations in Quebec, the Atlantic Provinces, the prairies and northern B.C. The drive to extract new reserves as fast as possible has already sparked concern and protest in many areas, including a dramatic confrontation with First Nations groups in New Brunswick.

Challenge #12: Given that in some areas of Canada natural gas is fracked using unconventional methods, and given the safety and environmental risks associated with fracking, Unifor believes that fracking technology poses both clear economic rewards and potential risks.

3.8 Managing Fossil Fuel Development

Energy prices (and associated raw materials such as metals, minerals and forestry products) are susceptible to a ‘commodity super-cycle’. A commodity super-cycle is like an ordinary business cycle except that it tends to be much longer in duration, lasting anywhere between 20 and 70 years. In the upswing of the cycle, when prices are rising, investment pours into energy projects. And while consumers face higher energy prices, jobs become more plentiful, wages tend to rise, profits soar and government coffers are stuffed with ‘petro dollars’. When prices are rising times seem good, but without long-term infrastructure planning, especially housing and other social infrastructure, the

Figure 3.2



short-lived boom gives rise to all sorts of social and political problems, including family breakup, geographic transfer and socio-economic dislocation. During the boom phase, people often assume that the high prices (and associated prosperity) will last. But the eventual (and inevitable) bust phase changes the assessment.

The shortcomings of the commodity super-cycle are always more apparent in the bust phase, as workers in the ten's of thousands lose their livelihoods, firms go bankrupt and government revenues

dry up, which puts a squeeze on families, communities and government coffers. Resource booms and busts can have adverse consequences for the overall national economy too, not just specific industries and regions. For example, the dramatic inflow of foreign investment into bitumen projects in recent years has been a key factor pushing the value of the Canadian dollar far above its historic value (see Figure 3.2, which contrasts the value of the Canadian dollar with the price of oil).

An inflated Canadian dollar is advantageous to importers and those travelling abroad, but it has caused major economic damage to many of Canada's other export-oriented industries, including manufacturing, services and tourism. In the period between 2002 and 2011, the Canadian dollar climbed from 64 cents U.S. to above parity with the U.S. dollar. During that time, manufacturing employment contracted by nearly 600,000 jobs—roughly one quarter of Canada's entire manufacturing base (see Figure 3.3, which contrasts the value of the dollar with manufacturing employment).

The enthusiasm for the resource boom also overlooks the fact that, historically speaking, Canadian prosperity has long been tied to its status as a net exporter (meaning Canada's exports outweigh its

imports). But as Figure 3.4 shows, Canada's export share of GDP is tightly synchronized with the exchange rate, and the latter closely tracks commodity prices. So as higher energy prices push up the value of the Canadian dollar, Canadian exports became less competitively priced and export industries, including advanced manufacturing, contract.

Not only has Canada's trade balance worsened since the onset of the commodity boom, a period in which Canada went from a strong trade surplus to a trade deficit, but the composition of Canadian exports shifted from a more industrially diversified blend of high technology products, such as motor vehicles and aerospace products, to raw materials. This trend has exacerbated Canada's historic role as a supplier of unprocessed natural resources—the so-called 'staples trap' (see Clarke *et al.* 2013).

Government must be proactive in regulating the macroeconomic and fiscal side-effects of resource activity, including

Figure 3.3

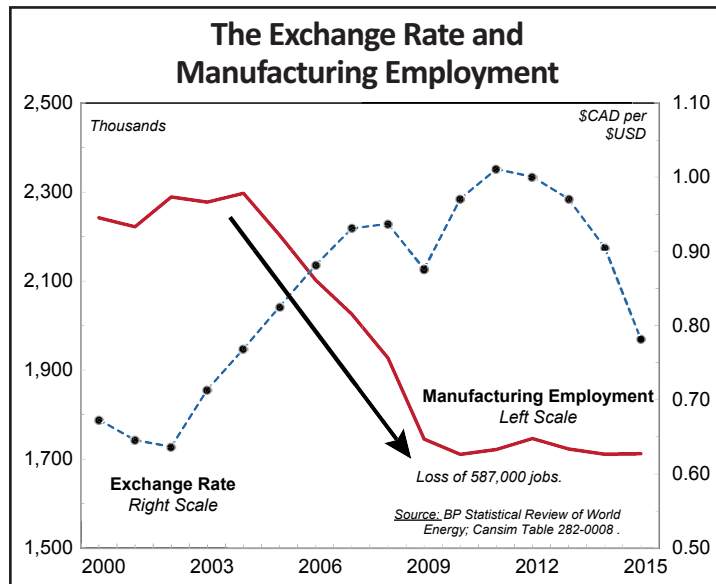
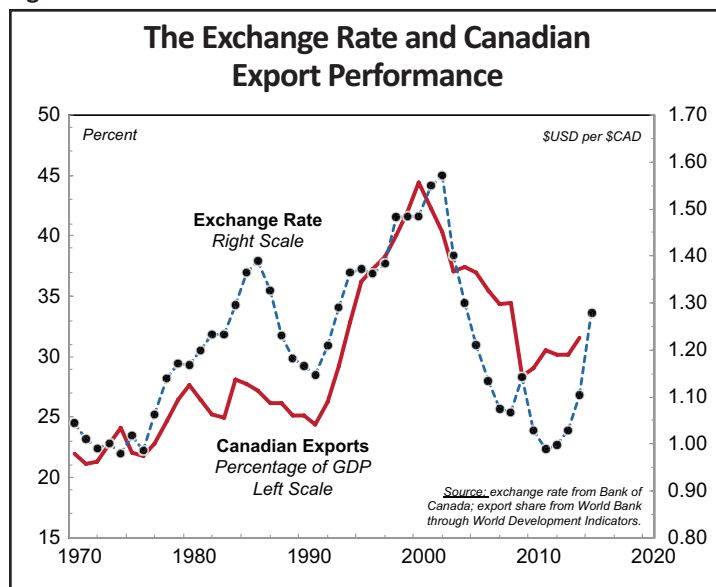


Figure 3.4



intervening to stabilize the exchange rate. A strong network of fiscal transfers within Canada must also be maintained in order to share the benefits of resource developments more broadly, and prevent the emergence of large regional inequalities.

Challenge #13: The unplanned expansion of energy mega projects, while being a crucial source of prosperity to many, creates tremendous instability for workers in the energy industry, as wild boom gives rise to bust. And by inflating the value of the Canadian dollar, unplanned expansion of bitumen projects undermines vital export industries, which creates industrial dislocation, unemployment and slower GDP growth.

3.9 Environmental Consequences of Energy Development

Apart from the problem of greenhouse gas emission, there are numerous issues associated with energy mega developments, transformation, transportation and consumption:

- Oil and gas exploration and development in parks and environmentally sensitive areas;
- Oil well gas flaring, which emits sulphur and other toxic substances into air sheds;
- Depleted water tables resulting from natural gas and oil wells;
- Ground water contamination from the heavy metal by-products of in-situ mining;
- Oil tanker spills and rail accidents involving toxic substances;
- Thermal pollution from oil refining;
- Radon gas emitted from gas plants;
- Soil and land contamination at refineries, service stations and gas plant sites;
- Air pollution from petrochemical plants;
- Sulphur and other emissions from coal-fired power plants and the other negative environmental impacts of coal mining;
- The environmental impacts of hydro power;
- The health, safety and environmental issues surrounding uranium mining and nuclear power plants.

Challenge #14: There are numerous adverse effects on the natural and social environment arising from energy extraction, transformation, transportation, storage and consumption.

4. Energy and Climate

In 1988 the United Nations established the Intergovernmental Panel on Climate Change (IPCC) to report on the scientific status of climate change and its economic and political impacts on the natural and social environment. The IPCC, which is widely seen as the leading global authority on climate science, produces assessment reports every five to seven years, the most recent of which was released in 2014. In the IPCC's judgement:

Human influence on the climate system is clear, and recent anthropogenic [human-generated] emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems.

Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen. (IPCC 2014: 2)

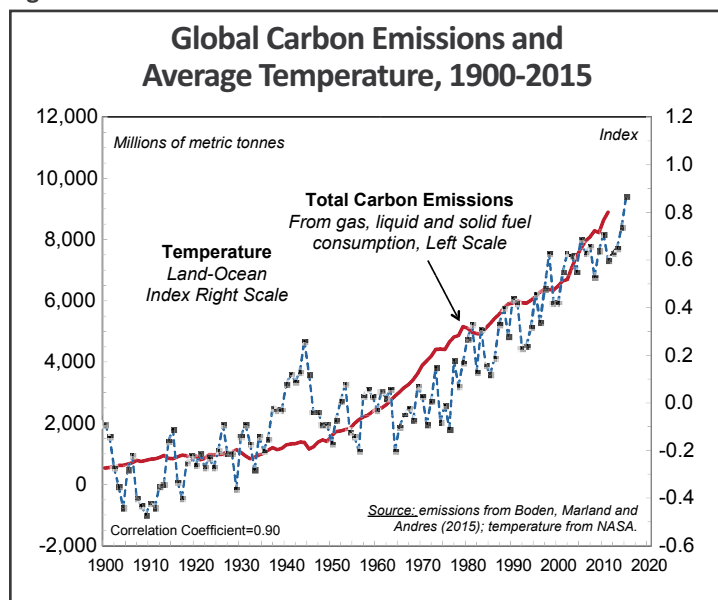
Climate change and the grave threat it poses to human civilization is integrally connected to energy production and usage. The present chapter will provide a brief overview of some of the key findings of the IPCC assessment report, detail how energy fits into the causal picture vis-à-vis climate change, outline Canada's international climate commitments, discuss possible solutions to the climate crisis (including carbon pricing) and briefly specify some of the principles required to make a climate policy broadly beneficial.

4.1 Industrial Civilization, Carbon Emissions and Climate Change

Technically, 'climate change' refers to an alteration in average weather patterns, the causes of which include variations in solar radiation, plate tectonics and volcanic eruptions. In popular discourse, however, 'climate change' or 'global warming' refers to the increase in average observed temperature in the earth's climate system since the mid-twentieth century. 'Anthropogenic' climate change is the increase in surface temperature resulting from the release of greenhouse gases (GHG's), including carbon dioxide, methane and nitrous oxide.¹² At lower levels of emissions, the burning of fossil fuels would ordinarily be absorbed by vegetation and the oceans. The historically unprecedented concentration of GHG emissions witnessed since mid-century has meant that more carbon is being stored in the earth's atmosphere, which is thought to be the leading cause of the temperature increases. The relationship between global carbon emissions and average land-ocean temperature increases is captured in Figure 4.1.

The IPCC claims that it is 'extremely likely' that human-induced GHG's emissions—resulting from the interplay between fossil fuel dependence, on the one hand, and population and economic growth, on the other—has been the 'dominant cause' of observed warming since mid-century (2014: 4). Ocean

Figure 4.1



warming, the IPCC continues, dominates the increase in the energy stored in the climate system, which has led to increased acidification of the ocean. Ice sheets in the poles have been losing mass, which has contributed to rising sea levels. Over time a rising sea level will induce mass human migration as coastal areas become uninhabitable, thus creating what some have called 'climate refugees'.

Other effects of the large increase in GHG emissions include extreme weather events such as heavy rainfall (and associated flooding), heavy snowfall, heat

waves, droughts and expansion of deserts. These weather alterations are expected to reduce crop yields and lead to more rapid species extinction. Worse still, the risks and effects of climate change are unevenly distributed, tending to fall more heavily on the backs of the poor and disadvantaged. Continued increases in emissions are expected to cause further warming and, beyond a certain point, irreversible effects on people and ecosystems. Constraining climate change, the IPCC continues, will require significant reductions in GHG emissions.

4.2 The Contribution of Energy Production and Usage

In the most recent data year global GHG emissions reached 49 gigatonnes of carbon dioxide equivalent per year (GtCO₂ eq/year).¹³ Roughly one half of all the human-induced carbon emissions dumped into the atmosphere between 1750 and 2010 have been generated in the past 40 years. In terms of specific gases, the IPCC reports that 65 percent of the total is the carbon dioxide associated with fossil fuels and industrial processes. A further 11 percent is the carbon dioxide associated with forestry and other land use. The remaining is made up of methane (16 percent of the total, associated with agriculture and waste management, for example), nitrous oxide (six percent, associated with fertilizer, for example) and fluorinated gases (two percent, associated with refrigeration and consumer products, for example).

The U.S. Environmental Protection Agency reports that, in terms of usage, electricity and heat production were the largest sources, accounting for 25 percent of total emissions, followed by agriculture, forestry and other land usage (at 24 percent), industry (at 21 percent), transportation (at 14 percent), other energy (e.g., fuel extraction, refining, processing, etc., at 10 percent) and buildings (at six percent). The top global emitters are China (28 percent), the U.S. (16 percent), the EU (10 percent), India (six percent), the Russian Federation (six percent) and Japan (four percent).

Figure 4.2

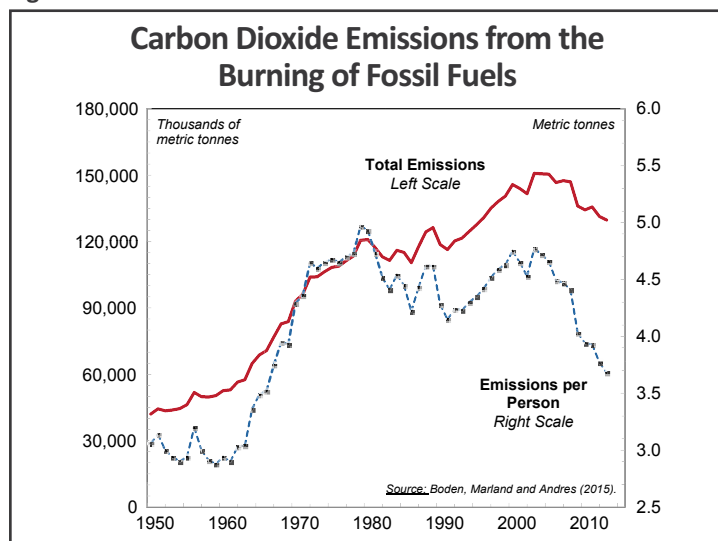


Figure 4.2 captures Canada's contribution to global emissions from the burning of fossil fuels by plotting the absolute amount of carbon dioxide emitted and the per capita amount.¹⁴ In 2013 Canada was the 13th largest emitter in the world on a country-ranking basis. However, overall emissions decreased by 14 percent between 2003 and 2013. On a per capita basis, the average Canadian emitted 3.7 metric tonnes of carbon dioxide in 2013, which is down 23 percent from 2003.

Globally, Canada ranks 21st on a per

capita basis. Australia and the U.S. rank 12th and 13th, respectively, while Qatar sits atop the list.

In its 2014 National Inventory Report, Environment and Climate Change Canada (2016: 4) reports that Canada's total GHG emissions (not just those from burning fossil fuels) were estimated at 732 megatonnes of carbon dioxide equivalent (Mt CO₂ eq), excluding land use, which was 20 percent above the 1990 total of 613 Mt. Emissions peaked at 758 Mt in 2007. Canada makes up roughly 0.5 percent of the global population but 1.6 percent of global GHG emissions, or triple the population-adjusted share.

The IPCC breaks emissions down into five key sectors: energy, industrial processes and product usage, agriculture, waste, and land use and forestry. Energy is by far the largest sector, accounting for 81 percent of the total. Agriculture makes up eight percent, industrial processes and product use make up seven percent, waste makes up four percent and land use and forestry makes up the remainder. Within the energy category, the largest single sub-sector is mining and upstream oil and gas production, which accounted for 14 percent of total GHG emissions in 2014. Between 2005 and 2014, Canadian GHG emissions declined by two percent (falling from 747 to 732 Mt). Despite the overall decrease, emission from mining and upstream oil and gas production (which we can assume are dominated by the oil sands) increased by nearly 50 percent (Environment and Climate Change Canada 2016: Table S-2, p. 7).

While every major Canadian sector saw a decline in emissions between 2005 and 2014, emissions from the oil and gas sector grew by 33 Mt. When the entire oil and gas industry is combined, including upstream oil and gas production, refining and 'fugitive sources', the emission total is 192 Mt. That's more than one-quarter of Canada's total emissions, roughly 13 percent more than the transportation sector and four times larger than the manufacturing sector. What's more, of the 20 percent increase in total Canadian emissions between 1990 and 2014, more than two-thirds

(70 percent) was accounted for by the oil and gas sector. Clearly, the oil and gas industry is of pivotal importance in Canadian emissions trends and so in Canada's climate policies (Environment and Climate Change Canada 2016: Table S-3, p. 11).

Alberta has 12 percent of Canada's population but emits 37 percent of total Canadian GHG's—100 Mt more than Ontario. Whereas Ontario and Quebec have seen emissions decline by six percent and seven percent, respectively, between 1990 and 2014, Alberta, Saskatchewan and British Columbia have seen emissions climb by 56 percent, 68 percent and 19 percent, respectively, over that period. The implication of these trend lines is stark. Alberta alone accounted for 83 percent of Canada's increase in GHG emissions between 1990 and 2014. The energy-intensive provinces tended to see sharp increases in emissions, while the provinces that are industrially tilted toward services (and which have seen a heavier loss of manufacturing industries) tended to decarbonise.

4.3 Constraining Greenhouse Gases

The foregoing implies that there is an imbalance between the earth's capacity to absorb GHG's and a petrochemical-fuelled industrial civilization. The threats to human security are grave and the adverse consequences to the biosphere appear incalculably large. In 1997, world governments took the first major political step in tackling climate change. A landmark agreement was reached in Kyoto, Japan—the 'Kyoto Protocol'—which committed participating countries to reduce GHG emissions to 5.2 percent below 1990 levels. Canada's objective was to shrink GHG's by six percent below 1990 levels by 2012. After intense domestic debate, the Liberal Government ratified the Kyoto Protocol in 2002. In the years that followed, the Government of Canada failed to take active measures to arrest the growth of GHG's and as a result emissions continued to rise. It took until 2011 for the Harper Government to formally withdraw from the Kyoto Protocol, though this did not come as a surprise, given their staunch opposition.

Despite the Harper Government's opposition to the Kyoto Protocol, in 2009 the federal government signed the Copenhagen Accord at the COP 15, a non-binding agreement that committed Canada to reduce emissions by 17 percent below 2005 levels by 2020. In May 2015 Canada indicated that it would aim to reduce emissions by 30 percent below 2005 levels by 2030. In December 2015 Canada signed the 'Paris Agreement' at the COP 21, which was an ambitious and far-reaching agreement meant to pull more of the leading polluters into the cause of decarbonisation and climate stability. Several guiding principles and commitments were established in the Paris Agreement, including the pledge to tabulate and publish national inventories of human-induced emissions by source, in addition to data on the storage of emissions in carbon sinks (Environment and Climate Change Canada 2016).

The IPCC recommends both adaptation (because human induced global warming has already begun and will continue to happen) and mitigation. In terms of mitigation, the IPCC recommends that warming be limited to two degrees Celsius relative to pre-industrial levels. This number implies that if atmospheric concentrations of carbon dioxide remain below 450 parts per million (ppm) by 2100, warming is likely to

remain below two degrees Celsius, which would avoid the worst consequences of planetary warming.¹⁵ The IPCC (2014: 20) estimates that GHG emissions will need to be reduced by 40 to 70 percent by 2050 compared with 2010 levels, and fall to near-zero by 2100 for climate stability to be attained.

Canada is playing catch up when it comes to climate policy. Some EU countries have had a carbon tax since the early 1990s. The Western Climate Initiative (WCI) is an assemblage of North American provinces and states that have agreed to price and trade carbon. Initiated in 2007, the WCI is a cross-border market-based program for reducing emissions that includes California and Quebec. British Columbia's carbon tax, introduced in 2008, made it the first North American jurisdiction to price carbon. The World Bank (2016) forecasts that by 2017 there will be some 40 national or subnational jurisdictions with a price on carbon covering nearly 15 percent of global emissions.

Despite decades of inaction, recent developments suggest that governments in Canada are taking the climate challenge seriously. Some recent provincial and federal-level measures, all supported by Unifor, include the following:

- In April 2015 British Columbia announced the formation of the Climate Leadership Team to build on the province's existing Climate Action Plan. Having tabled their report in October 2015, which included 32 recommendations, the Team recommended an increase in the existing \$30 per tonne carbon tax by \$10 annually, beginning in 2018;
- In November 2015 an agreement was hashed out between 195 countries to limit global temperature increases 'well below' two degrees Celsius compared to preindustrial levels at the COP 21 in Paris (the UN Climate Change Conference). This legally-binding agreement will compel the federal government to take action on climate change and to report regularly on the status of those actions;
- In November 2015 the advisory panel on Alberta's climate policies tabled its recommendations, including an economy-wide price for GHG emissions. The Notley Government has also set a 100 Mt cap on annual emissions from the oil sands, up from the current level of 70 Mt, to hedge against runaway emissions growth;
- In November 2015 the Government of Saskatchewan and SaskPower announced a target to increase the province's share of renewable electricity generation capacity to 50 percent, led by increases in wind power, hydro, solar, biomass and geothermal;
- In December 2015 the premiers of Ontario, Quebec and Manitoba signed a memorandum of understanding to facilitate the linking of future GHG cap and trade systems in Manitoba and Ontario with the system in Quebec;
- In May 2016 the Wynne government in Ontario passed seminal legislation, the *Climate Change Mitigation and Low Carbon Economy Act*, which will overhaul the relationship Ontarians have to their energy system by targeting the full spectrum of energy usage, including transportation, industry, residential and non-residential structures and electricity generation. The centrepiece of the plan is Ontario's commitment to join the WCI's cap and trade program.

These actions suggest that the gap between scientific understanding and political action is closing. It remains unclear if Canada's energy infrastructure is sufficiently adapted to harmonise the forecasted increase in fossil fuel production and consumption with provincial and federal commitments to decarbonise. Is Canada's green energy infrastructure, for example, adequate for the industrial pivot that decarbonisation requires? Mark Carney, the former Governor of the Bank of Canada and current Governor of the Bank of England, estimates that global decarbonisation will require something in the order of \$5 to \$7 trillion per year in clean energy infrastructure investment (Parkinson 2016). Is there a way to develop Canada's energy resources while meeting its climate commitments? This is perhaps *the* key policy question on the energy-climate file.

4.4 Possible Solutions: Carbon Pricing and/or Regulation

One possible solution to the problem of GHG pollution is attaching a price to carbon. By making polluters pay to emit, a carbon price incentivizes reductions in fossil fuel combustion. Two options tend to dominate the policy debate: a straight carbon tax, such as that found in British Columbia (and eventually, Alberta), or a cap and trade program, like the one operational in Quebec (and soon, Ontario). A carbon tax is simple levy on the burning of fossil fuels. The breadth of the tax can vary. Carbon can be taxed wherever it is combusted or particular sectors can be targeted. The trouble with a



carbon tax is this: without regulatory oversight, there is no guarantee that emissions will fall or that particular emissions targets will be reached. It is a leap of faith to assume that the adjustment in behaviour resulting from the tax will bring about the desired outcome, namely decarbonisation.

Unifor believes that carbon pricing is an appropriate policy response to the threat that climate change poses. Unifor also believes that a cap and trade system is preferable to a carbon tax. For starters, cap and trade includes both a market mechanism and regulatory oversight. Market participants, not the government, set the price through the purchase and sale of carbon ‘allowances’, while the government sets a maximum limit on emissions (the ‘cap’) and then proceeds to lower the ceiling each year in accordance with emissions goals, thus guaranteeing the environmental outcome. In Ontario’s proposed cap and trade scheme, for example, by the end of the first four year compliance period (in December 2020), emissions will be reduced by 15 percent below 1990 levels, with the cap gradually falling to 37 percent below 1990 levels by 2030 and 80 percent below by 2050. The combination of regulatory oversight and market pricing of carbon will likely prove to be a more potent policy option insofar as it provides greater certainty that emissions goal will be reached.

4.5 Principles for Making Carbon Pricing Beneficial

The obvious threat with either a carbon tax or a cap and trade program is industrial leakage. Firms operating in emissions-intensive trade-exposed (EITE) industries will see an increase in their cost structure, which may prompt them to relocate to jurisdictions that do not price carbon or which have a lower price. Unifor is acutely aware of the threat of industrial exodus. Of the 150 industrial operations mandated to participate in Ontario’s cap and trade program, for example, one-quarter are Unifor workplaces. Industrial migration from a carbon-pricing jurisdiction to a non-carbon-pricing jurisdiction (or a jurisdiction with a lower price) would eliminate jobs and make the province poorer while doing nothing to limit global emissions. Less competitively priced exports and regressive impacts on consumers are also policy challenges.

To address the potential adverse consequences arising from carbon pricing, Unifor believes a variety of measures should be put in place (see Unifor 2016 for greater detail):

- First, ‘transition credits’ should be allocated to industries that bear an extraordinary burden of change. Firms operating in EITE industries such as advanced manufacturing, steel and cement production, mining, pulp and paper and petrochemicals should receive allowances to foster employment stability and workplace transition;
- Second, the carbon pricing scheme should include a ‘carbon price border adjustment’ to ensure that commodities entering the province from jurisdictions without a carbon price (or with a lower price) do not gain an unfair cost advantage over local producers;
- Third, the carbon revenue system should not be revenue neutral. In British Columbia, for example,

the proceeds of the carbon tax are recycled through the tax system and returned to taxpayers. Governments at the federal and provincial level should create a 'Green Fund' to finance the policies required to decarbonise the economy in a just and socially sustainable manner. The Green Fund should be used:

- For 'Just Transition', a principle recognized by the International Labour Organization (2015) and explicitly referenced in the Paris Agreement. The thinking behind Just Transition is that if an industry is going to be legislated out of existence in order to meet an environmental goal, the burden of adjustment should not be borne by workers. Industrial restructuring can create large scale unemployment and lead to poverty and social dislocation. Just Transition is meant to mitigate or avoid these adverse consequences through a variety of measures, including labour market impact assessments, retraining, skills upgrading, income support, relocation assistance, pension bridging and employment insurance flexibility, among other measures;
- To mitigate the regressive impact on consumers, especially those living in low income;
- To foster the development of low carbon energy, green infrastructure and clean technology, including energy efficiency, retrofits and renewable energy. Workers in displaced industries (such as coal) would be retrained and matched with employment opportunities in these emerging industries.

A suite of policies designed to foster decarbonisation, clean technology and green energy while ensuring a Just Transition are what's needed for Canada to continue developing its energy resources in a sustainable manner while effectively responding to the threat of climate change.

5. A Better Vision For Canada's Energy Future

According to Lewis Mumford, the 'spinal principle' of democracy is to 'place what is common to all men above that which any organization, institution, or group may claim for itself' (1964:1). Josiah Ober explores the original meaning of term democracy and finds that instead of signifying 'majority rule' or even 'rule by the people', the term historically meant the 'collective capacity of the public to make good things happen in the public realm' (2008: 8). Because energy (in all its various forms) straddles the private and public realms, and is thus part of the common good, the Canadian public ought to exercise its capacity to 'make good things happen' when it comes to energy development.

Previous chapters outlined some of the challenges and opportunities associated with developing Canada's immense energy resources. Unifor believes that by deepening democratic engagement and oversight, Canadians will be better positioned to harvest the enormous energy wealth that Canada holds. The present chapter outlines some of guiding principles and policies for how to develop Canada's energy resources in an equitable and sustainable manner while respecting the treaty rights of First Nations peoples.

In a decarbonising world, our vision is to build a vibrant, productive and sustainable energy sector. Our resource industries can supply the natural inputs necessary for all other economic activity, generate good jobs for Canadians, help to pay our bills in global trade and respect the need for environmental protection. Our resource industries must also respect Aboriginal treaty rights and treat Aboriginal peoples as full partners in energy development. Achieving our vision of a truly wealth-creating resource sector would be a remarkable and progressive step forward for Canada.¹⁶

5.1 Production for Canadian Use

From the early 1970s onward, the United States (the largest 'free market' in the world) restricted energy exports for four consecutive decades in the name of 'energy security'. And while the world engages in an industrial pivot towards non-emitting fuel sources, the imperative to extract as much economic value from Canada's energy resources grows. While Western Canada is awash in oil and must export the bulk of its surplus to the United States, Eastern Canada is dependent upon foreign suppliers for its oil and natural gas needs, including feedstock for its refineries. The lack of west-east pipeline capacity is one of the main impediments in securing Canada's energy supply and asserting its independence, both of which remain policy issues for Unifor. As such, appropriate infrastructure should be put in place ensuring so that Canadians are not dependent upon foreign suppliers to meet their energy needs.

Policy #1: Unifor recommends that the federal government continue in the tradition of nation-building by ensuring that Canada's energy infrastructure is equipped to meet the energy needs of Canadians, including a strategy to match Canadian energy production with consumption, thereby reducing reliance on imports. This will include achieving security of supply and energy independence, which will require the completion of a Canada-wide energy grid, including pipelines and electricity transmission.

Insofar as NAFTA's proportionality clause imposes a limit on the democratic oversight and public regulation of Canadian energy development, especially the conservation of petroleum resources, Unifor opposes it.

5.2 Maximizing Economic Activity and Job Creation, Upstream and Downstream

If left to the short-term profit-maximizing decisions of private corporations, the Canadian economy would be pigeonholed into the narrow functions of extracting and exporting unprocessed resources. Past waves of resource development in Canada have proven the dangers of this narrow 'extractivist' approach: once the resource is depleted (and/or demand and prices have fallen), the only lasting legacy is social dislocation and environmental damage. Unifor is intent on leveraging Canada's resource wealth into broader and more lasting economic development. This will necessitate proactive measures that require Canadian processing, refining and secondary manufacture of resources down the supply chain, including petroleum products, chemicals and plastics. It will also require deliberate efforts to increase Canadian content in the various inputs and supplies that are purchased by resource industries (such as machinery, equipment and services). In this manner, the economic benefit to Canadians from resource development will be enhanced.

Unifor believes that Canada's energy wealth should be managed view a view to maximal long-term job creation and spinoff economic activity. This task is all the more important given the limited job content of many machinery-intensive resource products. For example, every \$1 million of GDP in oil and gas production creates just one-half of one job. Compare this with the 10 jobs in manufacturing and transportation industries and the eight jobs in construction. Strong Canadian content rules requiring more upstream supplies and inputs, and more downstream refining and processing can help, as can rules requiring resource producers to create local jobs as a condition of new project approval. The Temporary Foreign Worker program has created an exploited pool of workers, unprotected by normal labour or legal standards. Any additional workforce needs of resource industries should be met through permanent immigration, rather than abusive temporary migration schemes.

Policy #2: Unifor calls for the re-establishment of strong linkages between Canada's energy policy and other industrial and economic policies. Canada's natural resource wealth should be the basis for industrial development.

Unifor recommends that the federal, provincial and territorial review process for new energy projects be amended to include an assessment of the potential industrial linkages between upstream extraction activities, on the one hand, and midstream and downstream refining and manufacturing activities, on the other. By identifying the points of contact throughout the supply chain, the review process can better ensure the maximization of Canadian economic activity. Efforts must be made to ensure deeper integration of the energy supply chain, including extraction, machinery, upgrading, refining, processing, manufacturing and services. Unifor recommends that strong Canadian content rules be added to the energy project review process so that considerations about secondary manufacture and the usage of Canadian-produced machinery and other inputs are included.

Unifor also calls for a regulatory requirement to provide adequate natural gas to the petrochemical sector for its future growth and development, including measures to support the future growth of NGLs and LNG production. Unifor supports an ‘energy for jobs’ policy which would see national and regional energy utility boards make employment stability in strategic export industries a determining factor in granting production permits for new oil, bitumen and natural gas projects.

The Temporary Foreign Worker Program should not be relied upon to match workers with energy companies. Local labour shortages should be remedied through a federal program that matches unemployed Canadians with job opportunities in the oil and gas industry.

5.3 Output of Carbon-based Fuels must be Planned and Regulated

We must move beyond the roller-coaster pattern of development which typified Canada’s resource past by regulating growth, investment and mega-project expansion carefully, so resource workers and their communities can enjoy stable, secure livelihoods rather than suffering through repeated but short-lived booms and busts. Resource booms and busts can have adverse consequences for the overall national economy, not just specific resource regions. For example, the dramatic inflow of foreign investment into bitumen projects since 2003 has been a key factor pushing the value of the Canadian dollar far above its historic value. In turn, this has caused major economic damage to all of Canada’s other export-oriented industries, including manufacturing, services and tourism.

Policy #3: Unifor recommends that the federal government (and associated state agencies) take a pro-active stance in regulating the macroeconomic and fiscal side-effects of energy resource development, including intervening to stabilize the exchange rate. A strong network of fiscal transfers within Canada must be maintained to share the benefits of resource development more broadly and prevent the emergence of large regional inequalities, bearing in mind the fact that the provinces in which energy resources are developed bear the burden of

environmental cleanup. Federal and/or provincial governments must establish hard caps on emissions-intensive extraction projects (such as those found in the oil sands) to ensure responsible long-term development of energy resources and compliance with international climate agreements.

5.4 Limiting Environmental Impacts and Greenhouse Gas Emissions

Resource industries confront the environmental limits on economic activity growth more directly than any other sector of our economy. After all, harvesting resources from nature (including the air we breathe, the water we drink, the land we live and work on and the raw materials we use in all forms of work) is the first step in all economic production. Other parts of the economy—including transportation, manufacturing and even services—depend on inputs provided directly or indirectly from the resource sector. Therefore, the relationship between the economy and the environment must be managed carefully and sustainably, so that our future well-being is not undermined by shortages of resources and/or the declining quality of the environment.

The enormous global problem of climate change is the most pressing example of this overarching challenge. Other environmental side-effects of resource development include land and habitat destruction, species extinction and other forms of air and water pollution. Improving the environmental performance of resource industries will require many strong measures, including careful limits on the scale of operations and the pace of expansion (especially important in Alberta's bitumen industry), the imposition of strict regulations on emissions and waste, the fostering of energy conservation and green energy sources and the requirement that resource companies internalize the cost of environmental clean-up.

Given that much of the natural gas extracted and consumed in Canada is produced using unconventional methods, including hydraulic fracturing and horizontal drilling – which implies that the Canadian industry generally, and Unifor's membership specifically, are economically dependent upon these techniques – and given that some scientists and research bodies have expressed concern about the negative public health and ecological consequences associated with unconventional natural gas extraction techniques, including air pollutants and ground and surface water contamination, among others, Unifor believes that unconventional natural gas poses clear economic rewards and potential health risks.

Policy #4: Unifor's vision is of a dynamic and competitive energy industry with binding and ambitious targets to reduce greenhouse gases at the provincial, territorial and/or federal levels, including a detailed plan on how Canada will meet the emissions commitments it made in the Paris Agreement.

Unifor calls on the federal government to establish a national multi-party council on climate change, including representatives from labour, First Nations, business, the scientific community, government and affected citizens, to develop and implement a national climate strategy, with ongoing monitoring and reporting to the public. Insofar as Unifor is a major stakeholder in the energy industry, Unifor commits to be actively involved in the development and implementation of a national climate strategy.

In conjunction with relevant labour unions, business and other stakeholders, Canada should implement an urban and suburban transit strategy predicated upon strong public transit systems with dense urban-suburban interconnections, provisions for Made-in-Canada transit equipment and heavy emphasis on non-emitting fuel sources, including new green energy infrastructure such as electric motor vehicle charging stations and zero emissions structures.

Unifor supports efforts to develop the new technologies used for carbon capture, storage and usage as part of a broader plan to shift to a low carbon economy. Given that governments are currently providing financial support to the natural gas industry to adopt green technology, incentives should be put in place for natural gas companies to embrace the latest ‘methane mapping’ technologies. This would help the industry identify and repair pipeline leakages, which would increase efficiency, conserve energy and reduce emissions.

Unifor supports its members in the natural gas industry and will vigorously defend their interests. To that end, Unifor calls on natural gas employers to utilize the most environmentally responsible technologies. In cases where transition to a newer technology is financially prohibitive, Unifor calls on the government to provide financial assistance to ease the burden of technological adoption. Given that the public health and environmental consequences of unconventional fracking have not been conclusively determined, Unifor calls on the federal government (Environment and Climate Change Canada in partnership with Natural Resources Canada, potentially, in consultation with Unifor, First Nations and other stakeholders) to undertake a study of the public health, social and ecological consequences of the natural gas extracted and consumed using unconventional techniques so that more information can be gathered about best practices and potential policy responses.

While industrial accidents are an unfortunate fact of life, the communities in which energy is extracted, processed and transported must not unfairly bear the burden of cleanup. The companies responsible for tailings ponds, water contamination, pipeline leakages, rail car accidents and other industrial incidents must be legally liable and financially responsible for any damage done to the natural or social environment, including clean-up, rehabilitation and financial compensation.

5.5 Alternative Fuels, Green Energy, Carbon Pricing and Transition Measures

The ups and downs of resource development impose tremendous strains on workers, who face job insecurity, pressure to relocate (often to remote locations) and disrupted family lives. Efforts to create good, sustainable jobs in our resource industries will require pro-active training and skills programs. As we shift the focus of our energy strategy from simple bulk extraction, to emphasize upgrading, refining and downstream manufacturing activities, we will need to assist affected workers and communities take advantage of the new opportunities. The same is true of our ambitious plan to create new jobs in green energy (including alternative and renewable energy sources, public transit and energy conservation investments). There is no reason why employment and security should be threatened by the transition to a green economy: in fact, if we do it right, workers will benefit. In partnership with labour unions, business, First Nations, environmental groups and other stakeholders, Canadian governments must begin to implement the industrial pivot required to align Canada's energy needs with its climate commitments and with the wider goals of ecological sustainability. This will require a suite of policies that encourage alternative fuels, green energy development and importantly, carbon pricing.

Policy #5: Governments in Canada must hasten the transition off heavy-emitting fuels (such as coal) in favour of fuel sources that emit fewer GHG's (such as natural gas) or are non-emitting (such as hydroelectricity and nuclear), bearing in mind the economic costs faced by households and the wider industry. Because of the environmental and social dangers associated with mega hydro developments and nuclear power accidents, ongoing stakeholder dialogue and strong public oversight are needed to ensure safety and sustainability.

Unifor supports an ambitious green energy plan, including investment in alternative and renewable energy sources, conservation, retrofits and clean technologies. The plan would include development of national and regional green energy grids to maximize Canadian and local self-sufficiency in energy, with a view to substituting sustainable Canadian energy sources for coal-powered electricity.

In addition to public education campaigns and the adoption of cutting-edge technology, Unifor believes that carbon pricing is an appropriate policy response to the threat that climate change poses. Unifor also believes that a cap and trade system is preferable to a carbon tax, in part because cap and trade includes both a market mechanism and regulatory oversight. Market participants, not the government, set the price through the purchase and sale of carbon allowances, while the government sets a maximum limit on emissions and proceeds to lower the ceiling each year in accordance with emissions goals, thus guaranteeing the environmental outcome. To address the potential adverse consequences arising from a cap and trade scheme or a carbon tax, Unifor believes a variety of measures should be put in place.



Policy #6: Unifor recommends applying a price to GHG pollution to incentivize its reduction. Because a cap and trade scheme includes both a market mechanism and regulatory oversight, and thus provides greater policy flexibility and certainty, Unifor prefers it to a straight carbon tax.

When implementing a carbon price, a variety of complementary measures are needed to minimize the danger of ‘industrial leakage’ (the loss of Canadian jobs to foreign jurisdictions on account of policy measures), export competitiveness and to avoid the regressive impacts on consumers. First, transition credits should be allocated to industries that bear an extraordinary burden of change (the petro-chemical industry, for example). Firms operating in emissions-intensive trade-exposed industries such as advanced manufacturing, steel and cement production, mining, pulp and paper and petrochemicals should receive allowances to foster employment stability and workplace transition. Second, the carbon pricing scheme should include a ‘carbon price border adjustment’ to ensure that commodities entering the province from jurisdictions without a carbon price (or with a lower price) do not gain an unfair cost advantage over local producers. Third, the carbon revenue system should not be revenue neutral. Government should create a ‘Green Fund’ to finance the policies required to decarbonise the economy in a just and socially sustainable manner.

The Green Fund should be used to finance ‘Just Transition’, a principle recognized by the International Labour Organization and explicitly referenced in the Paris Agreement. Just Transition includes a variety of measures such as labour market impact assessments, retraining, skills upgrading, income support, relocation assistance, pension bridging and employment insurance flexibility, among others. The Green Fund should be used to: mitigate the regressive impact on consumers, especially those living in low income; help families retrofit their homes by converting to green energy; foster the development of low carbon energy, green infrastructure and clean technology, including energy efficiency, industrial retrofits and renewable energy. Workers in displaced industries (such as coal) would be retrained and matched with employment opportunities in these emerging industries.

Recognizing the uncertainty and disruption occurring throughout the energy sector due to both the downturn in oil prices and ongoing technology and process changes, measures to enhance job security and facilitate restructuring (while minimizing the harm to energy sector workers) are an important consideration. Energy workers and their families should not be victimized by economic cycles and technical change (forces that are beyond the control of our members). Unifor's goal is not to prevent technical change, but to ensure that it is implemented in a manner which recognizes the rights of workers, rewards their productivity, enhances their working conditions and safety and facilitates their adjustment. Energy companies which pro-actively recruited workers during peak years (including working and living in remote locations) have a responsibility to support those workers during lean times.

Policy #7: Unifor recommends a Supplemental Unemployment Benefit (SUB) program to enhance income security wage replacement (above and beyond regular EI benefits) for laid-off energy workers. Unifor recommends that where job losses are expected to be permanent as a result of closure, restructuring or technical change, negotiated restructuring and early retirement incentives will be offered (on basis of seniority) to encourage voluntary severance and prevent lay-offs. For employers with multiple locations, laid-off workers from one location should be given preferential hiring opportunities at other locations of the same employer, and workers hired through that process will be provided relocation assistance. Laid-off workers in remote communities should be provided relocation assistance to move to alternative locations after lay-off.

Each workplace should establish a joint union-management committee on technological change that meets semi-annually (at least) to discuss evolving technological and process changes affecting employment levels, working conditions, skills and work practices.

5.6 Aboriginal Treaty Rights and Full Socio-Economic Participation

Canada was never an 'empty land'. Almost every place where resource extraction occurs, Aboriginal people live and work. It is thus a precondition for successful and sustainable resource production that the treaty rights of First Nations, Inuit and Metis people regarding the ownership and use of resources and land are fully respected, that they are full and willing partners in resource development and that Indigenous communities are given priority opportunities to benefit from the jobs and incomes generated by those developments.

Policy #8: A precondition of socially sustainable energy development is respect for the legal and treaty rights of Aboriginal peoples, as well as the rights of landowners. Unifor supports the principles embodied in the UN Declaration on the Rights of Indigenous Peoples and urges the Government of Canada to find creative ways to operationalize those principles, in conjunction

with other principles and values, including those embodied in legal rulings by the Supreme Court of Canada (the Haida Nation v British Columbia and Tsilhqot'in Nation v. British Columbia cases, for example). First Nations, Inuit and Metis peoples must be full and equal partners in resource development. Local labourers should be given priority opportunities to benefit from the jobs and incomes generated from energy development.

5.7 Transporting Oil and Gas

Over the long-term, export pipelines reduce Canadian oil and gas employment because of the failure to upgrade and refine the resource in Canada. Unifor opposes these export projects because of their negative impact on both the environment and the economy. We have and will continue to campaign for a national energy and environmental strategy so that future energy production is regulated in line with credible, progressive environmental commitments. To meet those targets, the expansion of future bitumen production will have to be limited.

Policy #9: Unifor opposes the export of raw bitumen, unprocessed crude oil and unprocessed natural gas, including the expansion of export pipeline capacity and export terminals. Unifor calls for the expansion of west-east oil pipeline capacity to bring Western Canadian crude to refineries in Eastern and Atlantic Canada. Because of the enhanced safety, lower GHG emissions and reduced cost, Unifor believes that pipelines are a safer, emissions-friendlier and economically superior option for transporting oil and natural gas. That said, strong regulatory oversight is needed to enforce compliance with existing safety laws on the part of energy companies.

Before energy exploration or pipeline construction on Aboriginal land (and other landowners) takes place, the pipeline company must first consult and negotiate with affected parties. It must also ensure that the economic benefit of pipeline development is equitably shared with impacted First Nations and that adequate safety measures are negotiated and planned.

Unifor supports strategies to maximize Canadian economic activity at all stages of energy production, including pipeline construction. With respect to LNG, Unifor supports the processing of natural gas with a view to exporting a finished product. Made-in-Canada provisions should be factored into National Energy Board decisions around pipeline approval. Unifor supports the precautionary principle, which, in this case, means that pipeline and other energy infrastructure should be subject to strong enforcement and oversight measures (inspection, monitoring, etc.) to ensure that existing safety laws are upheld.



5.8 Privatization, Ownership, Regulation and Taxation

Resource industries are traditionally subject to large inflows of foreign capital. However, dramatic outflows often follow when commodity prices inevitably plunge. The federal government has a crucial responsibility to carefully regulate incoming foreign direct investment, prohibiting it entirely in some sectors (potentially in uranium and other strategic areas), in addition to negotiating binding undertakings from those foreign firms whose investments and projects are approved. The experience of recent foreign takeovers in the natural resources sector (Inco, Falconbridge and Alcan, for example, which led to plant closures, layoffs and several long strikes and lockouts) proves that when a crucial Canadian productive asset becomes a mere cog in the wheel of a global corporation, Canadian workers, communities and economic performance may suffer. In some cases, public ownership could also play an important role in ensuring our resources are utilized in a sustainable, socially beneficial manner.

The resource wealth of our country ultimately belongs to Canadians, not to the corporations (many of which are foreign-based or have foreign owners) given licenses to extract it. Governments must take an active approach to ensuring that Canadians receive fair long-run value for their resources. Government royalties in the oil and gas industry must reflect the long-term value of those non-renewable resources, rather than cutting royalty rates to boost short-term profits and exploration activity. In particular, royalties collected in the petroleum industry (including bitumen projects, and offshore developments in Atlantic Canada) are too low and must be raised as a key priority of energy policy.

Higher corporate income taxes must be imposed on resource corporations so they pay their fair share towards Canada's physical and social infrastructure. Deliberate efforts (such as project benefit agreements) must be made to allow targeted groups (including First Nations and other workers who regularly experience economic exclusion) first chance at participating in new resource-based opportunities. Labour laws must ensure a realistic balance of power between resource workers and the enormous global firms they work for, so that workers (with the help of their unions) can win wages and pensions commensurate with their effort and productivity.

Policy #10: Unifor opposes the privatization of strategic energy assets, including provincially-owned power companies, either in whole or in part. Because of its status as a public good, Unifor believes the exclusive right to set electricity and natural gas prices must reside with provincial and local regulatory agencies. Unifor calls on the federal government to amend the Investment Canada Act in a manner that would ensure continuity of employment, production and domestic industrial linkages in the case of a foreign takeover of a strategic asset in the energy industry. And finally, Unifor calls for a progressive royalty regime to ensure that Canada's energy wealth provides a stable economic base for social development. Low royalties and taxes are effectively a subsidy for fossil fuel companies. Canada's royalty regime should be scaled on the upper end of what is paid in other advanced countries.

6. Conclusion: Why This Matters

Like oxygen, food or water, energy consumption is one of the non-negotiable aspects of life. Modern civilization requires mechanized power to support and maintain life. As the largest energy union in Canada, Unifor has a keen interest in advancing a progressive vision of Canadian energy development. The current policy orientation, which is business-led and market-driven, appears ill-equipped to effectively address Canada's energy challenges.

That is why Unifor has advanced an alternative vision of Canadian energy development, which bolsters industrial dynamism and business competitiveness with a host of measures that would increase employment, responsibly manage output, deepen industrial linkages, enlarge economic activity, reduce carbon emissions, facilitate transition to green energy, respect Aboriginal treaty rights and equitably distribute natural resource wealth.

In a decarbonising world, where 'social license' is increasingly important, Unifor believes that governments in Canada will need to adjust their policy orientation if they are to effectively promote and manage energy development. We hope Unifor's Energy Policy is of some assistance in bringing about that policy reorientation.

6.1 Call to Action

In conjunction with the Energy Industry Council, Unifor's Leadership calls on governments at the federal, provincial and municipal levels to consult with Unifor about the establishment of a process to implement Unifor's Energy Policy.

Furthermore, Unifor calls for the establishment of a national multi-stakeholder committee comprised of representatives from energy unions, federal and provincial governments, leading energy firms and industry associations, Aboriginal groups and environmental NGO's to collaborate on a new direction for Canada's energy policy, preferably one informed by Unifor's vision.

Unifor's individual members in energy and non-energy industries are strongly encouraged to familiarize themselves with Unifor's Energy Policy so that they can be effective advocates and campaigners for a progressive energy future. Unifor's members are also encouraged to reach out to relevant political representatives and encourage them to implement Unifor's Energy Policy.

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- ¹ Prior to 1887, mineral rights were privately owned and transferrable. After 1887, mineral rights were reserved by the Crown and could be leased. This is why the Hudson Bay Company and CP Rail, who owned mineral rights to millions of acres of land, were important players in the history of Canadian energy (Bliss 1987: 520, 524).
- ² See Sections 109 and 92A, respectively, of the 1867 British North America Act, available online at: http://www.solon.org/Constitutions/Canada/English/ca_1867.html.
- ³ Even the Ontario Government got into the game, acquiring a 25 percent stake in Suncor from its U.S. owner for \$650 million (Bliss 1987: 543).
- ⁴ A joule is a derived unit of energy and a terajoule is one trillion such units. A 'primary' energy form is one not subject to any conversion or transformation process. Primary energy is captured or harvested from natural energy flows, while secondary energy is manufactured (or transformed) primary energy.
- ⁵ One terawatt is equal to one trillion watts.
- ⁶ The Canadian Energy Pipeline Association developed an interactive map of liquid and natural gas pipelines in North America: <http://www.cepa.com/map/index-en.html>.
- ⁷ This list is confined to the largest oil and gas firms, ranked by market capitalization, that traded on the TSX in 2013. Being TSX-traded does not preclude a firm from having foreign owners, as in the case of Imperial Oil, which is owned by American-based Exxon-Mobil.
- ⁸ This figure includes oil and gas extraction (and support activities), natural gas distribution, petroleum manufacturing and pipeline transportation. It excludes coal, electric power and gasoline stations (see Cansim Table 029-0046).
- ⁹ Parts of this section are transplanted verbatim from Unifor (2013a: 8-12).
- ¹⁰ See Green and Jackson (2015).
- ¹¹ See S.J. Carlson: http://web.mit.edu/hsr-group/documents/showcase_JC.pdf.
- ¹² They are called 'greenhouse' gases because they trap heat in the earth's atmosphere.
- ¹³ A gigatonne is one billion tonnes.
- ¹⁴ Data retrieved from the Carbon Dioxide Information Analysis Centre: <http://cdiac.ornl.gov/>.
- ¹⁵ Parts per million' is a unit of measure used to tabulate the atmospheric concentration of carbon dioxide.
- ¹⁶ Some of the content that follows draws on Unifor (2013a).



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