

Executive Summary and Foreword from Ken Kobly and John Carpenter

First, do no harm

With the recent change and reduction to Alberta's royalty structure on oil and natural gas, the provincial government has restored Alberta to near its traditional position as a world leader for attracting investment in energy.

That recent, significant policy change has reduced concern in Alberta's energy sector about competitiveness issues as compared with other jurisdiction. Now, the focus in Alberta and on Alberta in the foreseeable future will likely concentrate around three significant areas:

- the environmental record of Alberta's energy industry
- that sector's economic importance to both Alberta and the rest of Canada
- the potential for Alberta energy—conventional and alternative

Implicit in those three areas are questions of provincial government policy:

- what can Alberta's government (or private industry for that matter) do to make Alberta a more prosperous, more environmentally friendly place
- how can government and industry rectify misconceptions about Alberta and her energy industry at home and abroad

This fourth report in the Vision 2020 series from the Alberta Chambers of Commerce and CGA Alberta's Research and Education Foundation focuses on renewing Alberta and her energy sector, in the conventional and alternative energy sectors. The report challenges some of the myths about Alberta's energy industry, most often as they concern the oil sands, reminds readers (or perhaps informs them for the first time) of just how valuable Alberta's energy sector is to not only Albertans, but to all Canadians. Finally, it examines what can be done through policy on alternative energy.

It is useful to be clear about one important principle guiding this phase IV report and its predecessors. That

principle is to "do no harm." Governments can, through the best of intentions and through attempts to balance public and private interests, injure one or the other, create perverse incentives, and bring about unintended consequences. We advocate that private and public interests be seen as compatible and not in opposition, and that economic development and environmental protection be seen as congruent.

It is also important to be aware of the benefits of oil and gas to the province, the country and the rest of the world. Alberta's energy supply is in general safer, environmentally cleaner than assumed and, given other factors surrounding energy extraction (such as economic development, corruption and questionable uses of some energy profits elsewhere) the province's energy is far more beneficial than realized.

Facts: How Alberta's energy industry benefits Canada

- While foreign direct investment in the resource sector accounted for one-third of all investment flows over most of the last two decades, it jumped to 50% in 2006 and 2007. In 2008, exports of natural resources accounted for 65% of all goods exports, up from 45% in 2002.
- Over the past decade, Alberta has been a magnet for workers from the rest of Canada and in particular, provinces such as Newfoundland which has had double-digit unemployment rates for several decades. Near the height of the "boom" in November 2007, Newfoundland's unemployment rate was 13.2% and Ontario's was 6.2% while Alberta's was 3.6%.
- The Canadian Association for Petroleum Producers (CAPP), the country's main industry association for large producers, points out 44% of the employment generated by the oil sands investment is outside of Alberta, with a significant part in the manufacturing heartland of Canada—Ontario and Quebec.
- On the basis of federal tax paid, the average tax filer in Canada paid \$4,346 in federal income tax in 2007 (the latest year for which complete statistics

are available). In Newfoundland, the average was \$2627, while the average in Ontario at \$4,695. By contrast, the average federal income tax paid by an Albertan in 2007 was \$6,937. That is a 48% gap between Ontario and Alberta.

Some of the myths and half-truths on the environment

Facts on the size of the oil sands and its above-ground footprint

In its campaign against the oil sands, Greenpeace asserts that "Deposits of tar sands are spread out over 138,000 km² of land (an area the size of Florida), including 4.3 million hectares of the Boreal Forest." The criticism implies oil sands will be strip-mined either entirely or very significantly. But "deposits" are not equal to "mined", which are a diminishing reality in the area. In fact, as Alberta Energy notes about the area:

- Alberta's oil sands underlie 142,200 km² (54,904 square miles) of land in the Athabasca, Cold Lake and Peace River areas in northern Alberta.
- Alberta's oil sands constitute just 4% of Canada's Boreal forest and only 4,800 square kilometres are mineable from the surface – representing 0.15% of the entire Boreal forest.
- As of March 31, 2009, just 602 km² have been disturbed by oil sands mining, about the size of Edmonton, which accounts for 0.3% of the oil sands area.

As of 2009, bitumen production was 1.5 million barrels per day with surface mining accounting for 55% and of that production, and with bitumen, extracted using the less invasive in-situ methods for 45% (in-situ is any non-mining method of recovering oil in the oil sands). The share of in-situ is forecast to rise to the point where 80% of the oil sands deposits are forecast to be recovered through the thermal in-situ recovery method, not strip mining.

That this still causes environmental disruption is clear, but absent a world with zero energy requirements,

the question is not whether some disruption of the environment will occur but how extensive it will be and how to minimize the same.

Facts on well-to-wheel comparisons

One accusation levelled against the oil sands in particular is the size of the "carbon footprint." There are wild miscalculations circulating about that carbon footprint. In fact, the Pembina Institute notes "the production of synthetic crude oil from oil sands is approximately 10% to 20% more GHG-intensive ["well-to-wheels"] than Canadian conventional oil production." The Alberta Energy Research Institute confirms that oil sands crude is only 10% more GHG intensive. Alberta Energy notes that since 1990, "GHG emissions per barrel of oil from the oil sands have been reduced by an average of one-third ... Some facilities have achieved reductions as high as 45%. "In addition, it is useful to know that the majority of carbon dioxide is produced (78%) through consumption of oil in automobiles, in factories and through other end user applications.

Facts on water use

The main source of water for oil sands development is the Athabasca River. The total allocation of water from the Athabasca for all uses—oil sands, industrial and municipal—is just 4.3 % of the flow. Current oil sands mining projects use just 1% of the Athabasca River flow. If all oil sands projects on the drawing board were approved, the oil sands would use 2% of the Athabasca River flow. That compares to:

- 28% allocation of the North Saskatchewan River
- 69% allocation of the Oldman River in southern Alberta
- 69% allocation of the Bow River

Facts on air quality

- Studies from the Alberta Clean Air Strategic Alliance note the air quality has consistently improved around the region where Canada's oil sands are located, the Fort McMurray Wood Buffalo Region.

- The industry notes there are about 10 times more air monitoring stations in the Wood Buffalo region as there are for the United States on a per capita basis.
- Air quality around oil sands operations is better than all North American cities benchmarked by the Alberta Clean Air Strategic Alliance.
- The oil sands industry has continually reduced nitrogen dioxide (NO₂) and sulphur dioxide (SO₂) emissions on a per barrel basis since production first began and new guidelines will reduce nitrogen oxides emissions from future stacks, boilers and heaters by as much as 50%.
- In comparison to other Canadian communities, Fort McMurray ranked better than centres such as Toronto, Winnipeg, Edmonton, Calgary and Fort Saskatchewan in annual average concentrations of nitrogen dioxide and sulphur dioxide.
- New York City has about 12 times the annual average concentrations of sulphur dioxide in the air as Fort McMurray, and Dallas has more than twice the amount of nitrogen dioxide.

Facts on reclamation

Any mining activity will disturb the landscape. The oil sands operations are no different. However, the oil sands sector is increasingly moving to in-situ operations which will disturb the Boreal forest less than in the past.

- 530 km² have been disturbed by mining operations— which has led to a supply equal to 50% of Canada's crude oil requirements.
- At present, 65 km² are being reclaimed.
- Oil sands reclamation can be favourably contrasted with that of power from hydro-electric development, where flooded land is never reclaimed.

Facts on pipelines versus tankers

Criticism of the oil sands has also come from those who are concerned about the prospect of additional pipelines disturbing the landscape. There is some justifiable cause for concern, but the reality of an energy-dependent world is that the choice for governments, populations and industry is either pipelines or sea-faring tankers. The latter is a more dangerous and potentially environmentally harmful way to transport crude oil.

- Pipelines can be quickly repaired and any oil leakage more easily stopped and cleaned up when compared to oil spillages at sea.
- As Stuart Baird and Douglas Hayhoe point out in a report for the Society for Promoting Environmental Conservation, high-profile, head-line grabbing spills such as the Exxon Valdez off the coast of Alaska in 1989, or the recent Gulf of Mexico well blowout, represent only part of discharges into the world's oceans. They note accidental spills from tankers account for only about 20% of the crude oil discharged into the world's oceans each year. The remaining 80% is largely a result of routine oil tanker operations such as emptying ballast tanks.

Facts on environmental spending: The energy industry and Alberta

- According to the latest data available from Statistics Canada, in 2006 Canada's energy industry spent one-third of the \$8.6 billion total spent on environmental protection.
- The energy sector's \$2.8 billion share was more than any other industry. In addition, by province, industries in Alberta spent the most in facilities and equipment to protect the environment. According to Statistics Canada: capital investment by businesses in Alberta for environmental protection amounted to nearly \$1.9 billion in 2006, almost half (49%) of the capital expenditures nationally.
- In comparison, Ontario businesses reported \$827 million in capital expenditures on the environment, followed by those in Quebec at \$371 million.

- Regarding operating expenses for environmental protection, businesses in Ontario reported spending almost \$1.6 billion, the largest amount; Alberta businesses were second with operating expenses of just over \$1.3 billion.

Facts on renewable energy in Canada versus the world

Canada has weathered vocal criticism of its use and production of non-renewable energy. However, critics neglect two important facts. First, the use of energy is largely determined by the degree of industrialization. Moreover, relative to similar countries, Canada has considerable heating needs. Unlike France, the United Kingdom and Australia, there is no alternative to heavy energy use in the middle of a Canadian winter where temperatures can and do plunge to minus double digits in much of the country for several months of the year. Second, relative to other countries, Canada's use of renewable energy is already significantly higher as a percentage of energy consumption. That fact needs to be noted more often by governments, industry and media, since Alberta's energy industry is only one facet of the larger energy industry within Canada. In 2007, the worldwide average for primary energy use was as follows:

OECD average: Primary energy sources

Oil	38.4%
Natural gas	22.9%
Coal	21.0%
Nuclear	10.8%
Renewables	6.5%
Non-renewable waste	0.3%

Canada average: Primary energy sources

Oil	35.1%
Natural gas	29.3%
Renewables	16.2%
Coal	11.2%
Nuclear	9.0%

Canada's record on the mix of renewable energy is also superior to the worldwide average. Not all renewable energy is created alike. The International Energy Agency notes the 2007 product shares in world renewable energy supply are as follows:

OECD average: Renewable energy breakdown by source

Renewable combustibles and waste	56.6%
Hydro	30.2%
Other	13.2%

Canada average: Renewable energy breakdown by source

Renewable combustibles and waste	26.6%
Hydro	72.8%
Other	0.6%

Recommendations

The Alberta Chambers of Commerce and CGA Alberta began the Vision 2020 series as a broad-based research project to better understand Alberta's social and economic policy options. Vital to that understanding is knowledge of the trends that lay the foundation for the future. This is enormously important in the energy industry, Alberta's prime economic driver.

Alberta has been inappropriately subjected to world-wide scorn for its oil sands development and risks policy directives from other countries and customers negatively affecting the future prosperity of the province's economic engine. Additionally, by definition, Alberta's hydrocarbon economy is a limited one. At some point, the oil runs out. Lastly, and more positively, there is a tremendous opportunity available now for Alberta to take advantage of its expertise in the face of changing technology and societal demands. By transforming Alberta from a hydrocarbon economy into an "energy" economy, we build upon the strengths already present here and diversify in a way that makes far more sense than trying to develop completely new capabilities.

The focus of this Phase IV report of Vision 2020 is to identify public policy options aimed at assisting the hydrocarbon industry in transforming itself into an energy industry. To that end, we offer the following recommendations.

Recommendation One: The Alberta Government and the energy industry should remain aware of opportunities to add value to basic resource outputs produced in Alberta and should consider policies (other than direct subsidies or government ownership) whereby this can be achieved.

This recommendation does not contemplate direct government interference in markets. Governments worldwide have historically demonstrated an inability to take and follow-up on such decisions in an unbiased, qualified way. However, other jurisdictions will enjoy the benefits of adding value to Alberta resources where established infrastructure makes it economically attractive to do so at the margin. The most obvious contemporary example is pipelining bitumen to refineries out of Alberta. The result is lost jobs, lost tax revenue and lost opportunity for Albertans.

Recommendation Two: Support (as to policy but not with subsidies) proposed pipelines to Canada's west coast in light of the Obama administration's rhetoric on Alberta oil sands

Currently, there is only one pipeline to Canada's west coast from Alberta – a 300,000-barrel-per-day pipeline which services mostly domestic demand with two expansion plans to increase capacity by another 400,000 barrels (700,000 in total). Enbridge has proposed a twin, \$4 billion, 1,170 kilometre, 525,000-barrel per day barrel pipeline to Kitimat, British Columbia.

As a diversification measure, the project should be supported by the Alberta Government as an alternative to the risk of over-reliance on the American market, especially in light of the continuing rhetoric about Alberta's "dirty oil" that is influencing policy and business practices in the US, and could potentially lead to restrictions.

Recommendation Three: The province should refocus Alberta Innovates to target the first two phases of R&D (basic research/research and development) and large demonstration projects in order to attract investment.

The province should consider imitating the Industrial Technology Research Institute of Taiwan approach and create royalty agreements where tax dollars are used to fund such research. The development of royalty agreements will help ensure value creation of Alberta-funded research can remain in the province.

Recommendation Four: The province must continue its opposition to a single national securities regulator.

One of the benefits of the development of our energy industry is the concurrent development of local expertise in meeting the large capital needs of the industry. Those direct needs have unique aspects best met locally within a policy framework attuned to them. Doing so will create the foundational infrastructure upon which an expanding Alberta "finance industry" can thrive. Regulation of our markets elsewhere will constrain both our accounting and finance industries.

Beyond the obvious, specialized needs of the industry financing, our energy industry creates an opportunity to develop expertise and organizations locally which deal with large, complex and international financing issues. That capability can be applied outside of the industry once it reaches a critical mass, and it forms a foundation on which to build a more diversified, knowledge-based economy.

Recommendation Five: The province should partner with industry to develop an energy ambassador program to combat the negative attention to which the hydrocarbon industry is subjected and to help support development of an expanded energy sector.

While the provincial government has a role in supporting the industry internationally and at home, there is a dynamic tension created with its role as regulator. The provincial

government should partner with industry to develop an energy ambassador program or secretariat, perhaps as a part of the Alberta Economic Development Authority, which would be responsible for engaging media, developing speaking opportunities and countering misinformation as it relates to the hydrocarbon industry. This program could also be used to help lay ground work for opportunities in the developing energy industry.

Recommendation Six: The provincial government should develop and promote a strategy to leverage Alberta capabilities in hydrocarbon energy and its financing into the creation and economic exploitation of non-hydrocarbon energy.

This is not to suggest any form of bias or policy exclusion of oil and gas in our economic landscape. The goal is to apply what we have learned from our success in one area of the energy economy into other energy opportunities. This can be achieved through the support of our universities, our tax system and our regulatory frameworks. The result will be a broader industrial base and the opportunity to innovate and add value with a larger, but still related, area of economic activity. To an Albertan, the opportunities in oil and gas can be considered along with those in “alternative energy” sources.

Much is written about the demise of hydrocarbon-based energy either from supply exhaustion or from demand hampered by regulatory or market-based mechanisms. Even if we disagree with some of the arguments around the human causes of global warming or supporters of environmental restrictions on our resource, the issue is moot. There are real pressures today to move away from hydrocarbon-based energy sources. Alberta need not lose in this evolution.

Alberta must respond to the progression away from hydrocarbon energy intelligently. The threat is that the development of a new energy economy is occurring and will occur elsewhere, particularly if the local regulatory environment or policies are not favorable for broader energy development.

The good news is that, in previous periods of economic challenge, Albertans have demonstrated how adaptable our knowledge is to different price environments or market conditions. Our government, our regulators, our institutions and our universities must remain adaptable to “energy” versus just “hydro-carbon” so we can be best positioned to exploit the new energy economy.

Recommendation Seven: The provincial government should review existing provincial and municipal policy to ensure the user-pay principle is in effect for all resources, non-renewable and renewable, and that it is in effect for every user.

Research has shown price signals drive behaviour. As an example, a 2010 survey of consumers and water usage found three in ten were not aware of how much their water was costing, in part because rates are kept artificially low. The same applies to our hydrocarbon economy. Price signals help consumers understand and value the consumption of our resources. Implementation of a user-pay principle in water consumption, for example, can help Albertans better accept alternative energy options. Additionally, such a policy shows the world Alberta’s willingness to be “environmentally friendly.”

The user-pay principle also makes sense for other reasons—infrastructure upgrades should be paid for by users and not taxpayers in general. Where it does not now exist, governments and industry should charge full market rates. Examples of how to do this include:

- Require individual metered billing for all energy use including for rental units and charging more for peak hour usage to all consumers, industrial and individual.
- Ensure water usage, private and commercial, is always charged at market rates regardless of the usage.

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