

Project Committee Final Technical Report

on Alberta's Natural Gas & Conventional Oil Investment Competitiveness

to the Alberta Department of Energy



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TABLE OF CONTENTS

1. Executive Summary	1
2. Introduction	8
3. Understanding the Business	1
4. Competitiveness Framework	5
5. Geographic Features	8
6. Fiscal Regime	3
7. Regulatory Regime	1
8. Technology & Innovation	3
9. Business Climate: Leadership & Partnerships; Communication & Education	4
10. The Case for Change	б
11. Recommendations	2
12. Conclusion	0

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1. EXECUTIVE SUMMARY

This is the report of the project committee assembled by Alberta Department of Energy to undertake a review of Alberta's competiveness for investment in the natural gas and conventional oil industry¹. The review included technical analysis led by the Alberta Department of Energy and supported by consultants' reports. The project committee consulted with industry and financial sector executives to gain insight on the factors influencing investment decisions. Alberta's natural gas and conventional oil industry competes for investment capital that moves to where investors believe the best opportunities exist.

Alberta's energy resources are the basis for the largest industry in the province and the largest single source of government revenue. Energy companies develop Alberta's energy resources by investing in exploration and production projects that create economic activity and jobs and generate government revenues (through royalties, land sales, taxes). Governments are an important part of helping to attract that investment.

Government policies influence investment decisions. Investment competitiveness is based in part on the royalty system, but the project committee found that other important factors influenced investment in Alberta's resources. These factors include: the regulatory system; support for innovation and technology; and the business climate. The business climate encompasses the quality of the partnership of citizens and government with investors and entrepreneurs. The Natural Gas and Conventional Oil Investment Competitiveness Study found that all of these factors have an impact on Alberta's ability to attract investment.

Changes in the Business

Alberta's natural gas resource faces strong competition from significant new supplies located much closer to the large markets in Eastern Canada and the United States (U.S.). Large supplies have also been found in Northeastern British Columbia (B.C.) where Alberta-based companies have been attracted by resource opportunities and active B.C. government support for the industry. In this environment of abundant supply, the price of natural gas has been, and is expected to continue to be significantly reduced from previous highs of \$10.00 to 12.00 per thousand cubic feet (Mcf). To compete for investment Alberta needs to enable natural gas producers to operate amidst a drastically altered economic environment of limited markets, higher costs and lower natural gas prices.

The challenges facing the conventional oil sector have emerged over time. Alberta's declining conventional oil resources are more difficult and expensive to extract. Significant oil still remains in the ground and there will continue to be huge demand for oil as conventional oil fields elsewhere are diminishing. Exploiting Alberta's remaining oil resources will require more expensive and innovative approaches.

¹ In this report the term 'industry' or 'energy industry' refers to private sector oil and gas companies and the financial companies that are a source of investment capital. The term 'sector' will be used when referring to natural gas and conventional oil independently, for example 'the natural gas sector'.

The significant changes in the natural gas and conventional oil business are features that are not going to disappear as the global economy recovers. In the competition for investment Alberta needs to ensure that fiscal, regulatory and policy conditions encourage investment in the oil and gas industry to ensure growing and sustainable production contributing to the provincial economy.

Alberta's Impact on Investment Decisions

Royalties

Companies and their investors compare royalties and taxes of various jurisdictions as they assess investment opportunities in the energy sector. An effective mechanism to mitigate investment risk is to recover spent capital as soon as possible. This is particularly important in the oil and gas business given the rapid decline in initial well productivity and the volatility of commodity prices. Alberta's royalty charges are higher in the early days of production than those of competing jurisdictions of British Columbia, Saskatchewan and United States. Alberta's higher "front-end" royalties makes investment less attractive and it delays the reinvestment of recovered capital.

The following chart illustrates that the Alberta Royalty Framework (ARF) has a higher royalty rate at the "front-end" then other jurisdictions for a typical conventional natural gas well.



Illustration of Royalty Rates – Natural Gas (Conventional Well at \$6.00/GJ) Source: Alberta Department of Energy

When a company is fortunate enough to get high production from a well at a time when prices are high there is an opportunity for significant revenue. In periods of high prices Alberta's maximum royalty rate is higher than in any competing North American jurisdiction. At the "high end" the



Alberta system can charge a 50% royalty which is considerably more than the 31% that the next highest jurisdiction charges. Investments in high producing wells during high price periods yield returns that help to offset losses suffered from unproductive and unsuccessful wells. When too much of the upside is taken in royalties the economic and financial risk of the industry increases making investments less attractive.

The following table illustrates that the Alberta Royalty Framework (ARF) has a maximum royalty rate that is higher in high price periods than other jurisdictions for a typical conventional natural gas well.

Jumisdiations	Maxim	Maximum Natural Gas Royalty Rates	
JULISAICHOIIS	\$6.00/Mcf	\$8.00/Mcf	
ARF	35%	42%	
SK	29%	31%	
BC	25%	25%	
US	24%	24%	

Comparison of Maximum Natural Gas Royalties in Different Price Scenarios Source: Alberta Department of Energy

Other Competitiveness Factors

The Investment Competitiveness Study included industry and financial sector consultation regarding competiveness factors. There was significant feedback on the royalty rates. There was also considerable feedback on the other factors that influence investment decisions and future success: regulatory, technology and government policy.

Alberta prides itself as a jurisdiction that enables significant oil and gas production in an environmentally sustainable manner. The impact of the regulatory process is a significant factor in making investment decisions. While not disputing the goals of the regulatory system, Alberta's industry and investors believe that Alberta's system has become cumbersome and costly compared to competing jurisdictions. Stakeholders suggested that other North American jurisdictions maintain high standards without the complex and costly application processes and operating requirements.

Stakeholders stated their belief that government and the people of Alberta are all in the oil and gas business. All parties in this partnership stand to gain from improving Alberta's investment competiveness and therefore all have a role to play in the improvement process and in understanding the importance of natural gas and conventional oil as an engine of Alberta's economy and the sustainable way in which these resources can be developed. Government is seen as having a leadership role in supporting the energy business and the innovation and entrepreneurship required.

The Case for Change

The loss of investment is already becoming evident. Alberta's natural gas and conventional oil is in an environment of reduced investor confidence. Land sales for oil and gas leases are an indicator of where companies intend to invest in the future. The chart below illustrates the shift away from Alberta to neighbouring provinces.



Percentage of Western Canada Land Sales (1999-2007 vs. 2008- 2009) Source: Alberta Department of Energy - Province of British Columbia, Government of Saskatchewan

Improving Alberta's Competitiveness

If Alberta does not address the challenges of investment competitiveness a continued decline in investment will reduce the opportunities for Albertans to benefit from their resources. Solutions are needed to address the fiscal and regulatory issues. Government, the public and industry need to find ways to work more effectively to make Alberta a more competitive jurisdiction for oil and gas investment.

During the Investment Competitiveness Study principles were developed to guide development of recommendations for improved competitiveness. The principles are:

Partnership

- Alberta's resources are developed in a spirit of mutual trust, respect, and cooperation among industry, government and its citizens.

Equal Opportunity

- Alberta's resources are developed through open, transparent, and competitive markets.

Predictability

– Alberta's regulatory and fiscal policies promote confidence, predictability and stability.





Environment and Conservation

- Alberta's resources are developed in a manner that is consistent with good conservation practices and respect for the environment.

Knowledge and Innovation

- Alberta's resources are developed through practices that promote the advancement of technology;
- Alberta's resources are developed through practices that are based on a broad understanding of the opportunities and challenges faced by Alberta's oil and natural gas industry; and
- Sustainable and vibrant industry activity enables Alberta to be at the forefront of knowledge and innovation advances in the sector.

The following recommendations are provided as advice from the project committee to the government (Department of Energy). The recommendations are based on a common understanding of the business and incorporate the multiple factors that influence investment decisions.

Fiscal Regime

RECOMMENDATION 1:

Modify Alberta's royalty framework to address competitiveness and ensure industry activity in Alberta is sustainable and vibrant. The following design criteria should be considered when modifying the royalty framework for natural gas and conventional oil:

- Ensure that the modifications consider the fiscal impact and align with the provincial energy strategy, economic policy and objectives;
- Re-balance the royalty curves using current price and production variables so Alberta remains competitive with other jurisdictions;
- Reduce front end royalties. This recognizes high upfront costs and returns capital to companies quicker resulting in increased investment;

Reduce royalties at higher price levels;

Develop a transition program from the current system which does not disadvantage current drilling activity; and

Enhance the simplicity of the royalty framework.

RECOMMENDATION 2:

Develop programs if necessary to support strategic initiatives focused on specific resources or technology.

RECOMMENDATION 3:

Continually monitor the fiscal regimes of competing North American jurisdictions to ensure that Alberta is an attractive place in which to invest and do business.

RECOMMENDATION 4:

Examine the broader fiscal regime, including taxes, in partnership with Alberta Finance and Enterprise, to ensure investment competitiveness.

Regulatory Framework

RECOMMENDATION 5:

Reduce the regulatory burden and costs by redesigning the regulatory regime to: eliminate duplicate processes; reduce unnecessary delays and costs; reduce unnecessary requirements; and ensure alignment across government to make the system more competitive.

RECOMMENDATION 6:

Set measureable objectives for the regulatory regime (e.g., costs, timelines, and regulatory standards) and benchmark against other jurisdictions in North America to support continued competitiveness.

RECOMMENDATION 7:

Improve the flexibility of the regulatory regime to address new technology and resource opportunities.

Technology and Innovation

RECOMMENDATION 8:

The government must continue to leverage its innovation system in partnership with industry, the research community and other partners, to pursue joint technology and innovation strategies encompassing:

The fiscal system;

The regulatory system;

Knowledge transfer;

Educational investments; and

Research funding.

RECOMMENDATION 9:

Enhance technology development and deployment that supports industry in addressing the environmental impacts of the oil and gas sectors, and encourage the use of natural gas, a more environmentally friendly fuel source.



Business Climate

Leadership and Partnerships

RECOMMENDATION 10:

As a major partner in the energy business government (coordinated by DOE) should demonstrate stronger leadership by:

• Ensuring connection and alignment within government's policy and strategy;

Advocating on behalf of industry with other governments;

Removing obstacles to achieve strategic goals;

Influencing demand and seeking new markets;

Promoting the understanding of environmental impacts; and

Encouraging technology development.

RECOMMENDATION 11:

Establish regular interactions between government and industry to share information, ideas and discuss issues that support responsible and proactive resource development. Suggestions for interactions include:

Joint advisory committees of oil and gas executives and members of the financial sector;

Cross sector secondments; and

Information and education sessions on industry issues (e.g. Shale Gas Symposium).

Communication and Education

RECOMMENDATION 12:

Ensure that government better articulates and shares the vision of the Provincial Energy Strategy with Albertans, and the contribution of oil and gas to our economy, business and environment.

RECOMMENDATION 13:

Develop a communications strategy on the importance of the oil and gas business to Albertans and government's role in promoting responsible energy development.

RECOMMENDATION 14:

Government should improve its efforts to communicate the policies and actions that Alberta is undertaking toward the development of cleaner energy sources and the potential of natural gas as a source of that clean energy.

-7

2. INTRODUCTION

This is the report of the project committee assembled by Alberta Department of Energy (ADOE) to study Alberta's competiveness for investment in the natural gas and conventional oil industry. The study included technical analysis led by the ADOE and was supported by consultants' reports on the oil and gas sectors and economics. There was consultation with industry and financial sector executives to gain insight on the factors influencing their investment decisions.

The project committee consisted of:

Executive Sponsor:	Peter Watson, Deputy Minister, ADOE	
Project Committee Chair:	David Breakwell, Former Asst. Deputy Minister, ADOE	
Project Manager:	Barry Rodgers, Executive Director, ADOE	
Committee Members:	Stephen LeClair, Asst. Deputy Minister, Alberta Finance and Enterprise (AFE)	
	Christopher Fong, Financial sector advisor	
	Roger Thomas, Oil and Gas industry advisor	
Project Consultants:	Sierra Systems Group Inc.	

The Alberta Natural Gas and Conventional Oil Investment Competitiveness Study (ICS) started in July of 2009. Its goals are:

To determine the investment competitiveness of Alberta's conventional oil and natural gas resources;

Arrive at a common understanding of resource economics; and

Foster positive working relationships between government and industry.

For the purpose of this study, investment competitiveness is defined as Alberta's ability to attract investment to develop its natural gas and conventional oil resources to the benefit of Albertans. The study includes a review of industry technical data to ensure understanding the nature of Alberta's resources and the energy business; a summary of consultation with industry and financial sector executives to understand how government policy influences investment decisions; and recommendations that address issues that were raised.



The study title indicates that scope of the work was intended to include the entire natural gas sector of the industry. The conventional oil sector scope limitation is intended to set aside consideration of the oil sands sector. In this report the term 'industry' or 'energy industry' refers to private sector oil and gas companies and the financial companies that are a source of investment capital. The term 'sector' will be used when referring to natural gas and conventional oil independently, for example 'the natural gas sector'.

At the time the study was initiated there was a belief that Alberta was losing its competitive advantage to other North American jurisdictions such as British Columbia (B.C), Saskatchewan and the United States (U.S). A number of indicators suggested that the energy industry was facing challenges. The industry was subject to the forces of the economic downturn in 2008/09 resulting in lower demand and commodity prices. Reductions in activity and production resulted in significant reduction in economic activity, employment and government revenues for Albertans. Land sales by government declined, and oil and gas investment was reported to be flowing out of Alberta. The natural gas industry was facing competition from shale gas producers in the U.S. and B.C. which increased supply, brought prices down and attracted significant investment away from Alberta. The project committee sought to understand the underlying causes of these events and comments made by industry stakeholders that Alberta was losing its competitive advantage.

The study began in a period when industry and government was adjusting to a new fiscal regime in transitioning to the New Royalty Framework (NRF). The New Royalty Framework was developed in 2007, during a time of unprecedented commodity price increases and activity in Alberta. It was intended to modify the fiscal system to ensure that the sharing between industry and resource owners was appropriate. No sooner had the NRF been implemented when the global economic downturn hit and oil and gas prices dropped. Higher royalty rates in the NRF were not seen to be sustainable in the short-term and temporary programs were implemented to ensure continued industry activity. Concurrent changes in the natural gas sector indicated that even with an economic recovery, there were structural changes in this sector that required attention.

Alberta competes with other jurisdictions to attract the investment necessary to realize the potential of its resources. Alberta's desire to be competitive stems from the knowledge gained from over 60 years in the business. There are excellent resource opportunities in the province, and there is potential for continued prosperity and economic benefits to be enjoyed by all Albertans. Capital is mobile and there are many opportunities nationally and internationally to invest in the energy business. In order to participate effectively in the energy business it is important for the Department of Energy to understand the opportunities and challenges of Alberta's resources; know how the business works and ensure that there are good relationships with the producers and investors who work in Alberta.

Structure of the Report

To present the findings of the Investment Competitiveness Study the project committee assembled the report with the following sections:

Understanding the Business	An overview of the contributions and role industry plays in Alberta; how industry makes money; the risks industry faces; and the importance of continued investment in Alberta.	
Competitiveness Framework	A description of what is meant by competitiveness; the goal of competition; and the factors influencing success in the competition for investment.	
Competitiveness Factors	An examination of major factors influencing investment decisions and the way public policy can affect decision making. Factors include:	
	Geographic features; The fiscal regime; The regulatory regime; Technology & innovation; and The business climate.	
The Case for Change	An assessment of Alberta's competitive position to determine whether improvements can be made to enhance Alberta's attractiveness as a place to invest in.	
Recommendations	A set of recommendations developed by the project committee for government consideration, which reflects the implications of the technical analysis and stakeholder feedback.	



3. UNDERSTANDING THE BUSINESS

Alberta's energy industry is crucial to both the government and the province's citizens. The success of the industry over many years has helped create prosperity for Albertans. The government has a critical role to play in managing Alberta's vast resources. As Alberta faces challenges and risks in the development of its resources, government and industry must work together to create continued prosperity.

The Western Canada Sedimentary Basin (WCSB) is a massive wedge of rock that was created over hundreds of millions of years ago, producing 'fossil fuels' from trapped decaying organic materials². It lies under northeastern British Columbia, western Northwest Territories, most of Alberta, southern Saskatchewan and southwestern Manitoba. Sitting atop this basin, Alberta is blessed with diverse energy resources such as coal, oil, bitumen and natural gas.

To better understand how the industry functions, it is important to understand that it is divided into two sectors: upstream and downstream. The downstream sector refers to refining crude oil and selling and distributing natural gas and petrochemicals and the products derived from crude oil. The upstream sector, which is the focus of this report, refers to exploration, recovery, and production of crude oil and natural gas. This sector includes exploration and production (E&P) companies, and service companies comprised of drilling, servicing, supply, and manufacturing companies.

Alberta produces 69% of Canada's total crude oil, excluding synthetic, and 81.8% of Canada's total natural gas production³. This is a clear indication of Alberta's leading role in the Canadian energy industry. It is estimated that by 2030, energy consumption will rise by more than 45%.⁴ Until recently, Alberta's production has been derived from conventional reserves. What remains now, is a deeper, more difficult and more expensive resource to extract. Sources of future production and reserves will come from unconventional resources and the development of new technology. It is estimated that 70% of Western Canada's crude oil and 80% of natural gas conventional resources have yet to be recovered⁵. This section illustrates why the natural gas and conventional oil sectors are important to Albertans and the government. It also addresses the many factors that contribute to the overall health of the economy, such as Gross Domestic Product (GDP), employment and government revenues.

3.1. Contribution of the Industry

The oil and gas industry has clearly been the driving force behind Alberta's economic performance since the 1947 Leduc discovery. Oil and gas production alone directly account for about one sixth of the total goods and services produced within Alberta. But oil and gas also has significant indirect impacts on other industries: construction, pipelines, engineering and other



² Source: Alberta Provincial Energy Strategy, *The Way Forward*.

³ Source: Canadian Association of Petroleum Producers. *Statistical Handbook Table 3-01B*.

⁴ Source: International Energy Agency. World Energy Outlook 2008.

⁵ Source: Opportunity Calgary: Home of the Energy Industry

professional and technical services, petrochemicals, fabricated metals, machinery manufacturing, the financial industry, trade, accommodation and food services. Virtually every sector of the Alberta economy is touched in some way, directly or indirectly, by the oil and gas industry.

These direct and indirect linkages between the oil and gas industry and the rest of Alberta's economy, pose a significant challenge in coming up with a precise estimate of the industry's contribution to the Alberta economy. While the macroeconomic information on capital spending and GDP in this report is from the Conference Board of Canada, an additional study from the University of Calgary's report *Energy and the Alberta Economy: Past and Future Impacts and Implications*, estimated that once all these direct, indirect and induced effects were taken into account, the broadly-defined oil and gas sector accounted for about half the Alberta economy in 2004.

Gross Domestic Product (GDP)

According to Statistics Canada data, the oil and gas sectors and closely related industries directly accounted for approximately 30% of Alberta's total economy in 2008. Of that 30%, oil and gas extraction accounted for 55% of the sector. Note that this includes oil sands as well as gas and conventional oil.



Figure 1: Oil and Gas Sector Contribution to Alberta's GDP (2008) Source: Statistics Canada



Employment and Investment

The oil and gas industry is a big contributor to overall employment in Alberta. In 2009, direct employment in the mining, oil and gas extraction industry, accounted for 6.9% of total provincial employment. If you consider direct *and* indirect jobs, the energy industry as a whole provides 13.8% of total employment in the province,⁶ a significant portion. Table 1 shows the total Alberta employment by industry.

	Employees	% of total
Retail Trade	225,800	11.4%
Construction	191,800	9.6%
Health Care and Social Assistance	197,800	9.9%
Professional, Scientific and Technical Services	151,700	7.6%
Mining, Oil and Gas Extraction	136,300	6.9%
Manufacturing	123,100	6.2%
Educational Services	132,100	6.6%
Accomodation and Food Services	126,100	6.3%
Finance, Insurance, Real Estate and Leasing	109,700	5.5%
Transporation and Warehousing	103,300	5.2%
Other Services	100,100	5.0%
Wholesale Trade	75,700	3.8%
Public Administration	89,300	4.5%
Information, Culture, and Recreation	80,000	4.0%
Business, Building and Other Support Services	66,600	3.3%
Agriculture	55,300	2.8%
Utilities	20,400	1.0%
Forestry and Logging	2,800	0.1%
TOTAL	1,987,900	

Fable 1:	Employment by Industry, 2009	
Source:	Alberta Finance and Enterprise	

Jobs in the oil and gas industry tend to be full-time and highly paid. Average weekly earnings in the mining, upstream oil and gas sectors were \$1,721 in the first 11 months of 2009, almost double the economy-wide average of \$952. Not surprisingly, the mining, upstream oil and gas sectors accounted for 11.5% of total labour income in Alberta in the first three quarters of 2009.

Alberta's oil and gas industry is capital intensive. Although the industry directly accounts for less than 10% of total Alberta employment, it has directly accounted for 51% of Alberta's total non-housing related investment since 1995. Although oil sands investment has recently become as important as investment in natural gas and conventional oil sectors, investment in these sectors have accounted for 63% of Alberta's total mining investment since 1995. Figure 2 illustrates industry capital investment and reinvestment in Alberta from 1990 to 2009.

⁶ Source: <u>www.advancededandtech.alberta.ca/.../alberta%20produces%20fact%20sheet.pdf</u>. Note: Today, the energy industry accounts for approximately 275,000 direct and indirect jobs in Alberta.



Figure 2: Industry Capital Investment and Reinvestment in Alberta Source: Alberta Department of Energy

Drilling activity is a timely indicator of investment in the natural gas and conventional oil sectors as activity tends to be volatile and very responsive to changing conditions. As an example, the average number of rigs drilling increased by 41% between 1999 and 2000, largely as a result of improved prospects for natural gas, and then declined 24% in 2002 as prices weakened. Drilling activity then ramped up 65% between 2002 and 2005. Drilling activity remained near its peak in 2006, but then plunged by 35% in 2007, and again by 46% in 2009. The average number of rigs drilling in 2009 was back to levels not seen since the early 1990s. Statistics Canada initially estimated that Alberta's non-housing-related investment would fall by 15% in 2009, with oil sands investment accounting for almost half the decline and natural gas and conventional oil accounting for virtually all the rest.

With real business investment accounting for almost a third of Alberta's economy, the sharp drop in energy industry investment was a key factor behind Alberta joining the 2009 global recession. Alberta's economy contracted by an estimated 2.5% in 2009, similar to the Canadian average and much better than the 3.2% contraction estimated for Ontario, which was hit hard by problems in



the auto sector.⁷ Total Alberta employment dropped by 25,200 or 1.3% between 2008 and 2009 (Ontario employment, however dropped by 2.4%), with employment in the upstream oil and gas sectors down by 9,900 jobs.⁸

Investment in the natural gas and conventional oil sector has had a significant and immediate short-term impact on Alberta's overall economic performance. It also affects Alberta's longer term economic performance as the production associated with the additional investment comes on stream. Analysis by the Conference Board of Canada examines the impact of new development in natural gas and conventional oil on real GDP and employment, both in the short term and over the longer term. The Conference Board analysis shows how additional investment in the oil and gas industry provides a boost to economic growth and employment not only within the industry itself, but also in industries that directly supply the oil and gas industry – and the industries that supply them. The additional employment in Alberta and increased dollars are spent widely through the economy, spreading the benefits of the initial stimulus.

During the initial investment phase, the Conference Board study suggests that the largest impacts are from the construction, financial, and manufacturing sectors because of the lag before new production comes on-stream. Simulation results reveal that for each dollar of real capital investment, real GDP is lifted by \$1.44 in the first year of the simulation.⁹ A \$1-billion increase in investment would thus boost Alberta's real GDP by an estimated 0.6% in the first year, and raise average employment by almost 12,000. The bulk of the job creation occurs in the service sector because of the indirect and induced effects of new investment and production.

In subsequent years, the main impact comes from the increased production of the oil and gas sector, raising Alberta's real GDP by about 0.1%. The additional cash flow generated over the life of the well that is reinvested provides a further boost to economic growth and employment. Note that the additional boost through reinvestment is not captured in the \$1.44 simulation result.

Government Revenues

The energy industry has been the largest single contributor to government revenues in Alberta over the last ten years. The government serves as the steward of the resource on behalf of Albertans who are entitled to a portion of the revenues generated from the development of its resources. These revenues come in the form of royalties, taxes and land bonuses. Figure 3 depicts that for the period from 1999-2000 and 2008-09, non-renewable resource revenues from the energy industry (including oil sands) accounted on average for 32% or \$94 billion of Alberta's total revenues. Since the beginning of the 2009-10 fiscal years, government revenues from the industry have experienced a serious drop due to a sharp reduction in natural gas royalties.

⁷ Source: January 27, 2010 survey of private sector forecasters conducted by Alberta Finance and Enterprise.

⁸ Source: Statistics Canada Labour Force Survey. Note that the hardest hit sectors were manufacturing (21,000), trade (15,600), construction (13,500) and professional and scientific services (12,500). However, employment was up by 22,100 for the service sector as a whole.

⁹ Source: Assessing the Impact of Oil and Natural Gas Drilling in Alberta, Conference Board of Canada, December 2009



Figure 3: Non Renewable Resource Revenue as a Percentage of Total Government Revenues Source: Alberta Finance and Enterprise

ROYALTIES

Of the three forms of government revenues, those from royalties account for the largest portion. Figure 4 depicts that for the periods between 1999-2000 and 2008-09, natural gas and conventional oil royalties accounted for, on average, for 24% of Alberta's total revenues¹⁰. This translates into approximately \$70 billion in royalty revenues out of a total \$292 billion in government revenues. Based on information to the end of the second quarter of 2009, natural gas and conventional oil royalties were expected to account for approximately 10.9% of total government revenues.



¹⁰ Source: Alberta Finance and Enterprise.





TAXES

As one of the largest contributors to the Alberta economy, the oil and gas industry and those individuals and businesses associated with the industry pay a significant amount of taxes to provincial, federal and municipal governments. The taxes include, at the provincial and federal levels, corporate and personal income tax, indirect taxes (e.g., federal GST in Alberta), payroll taxes (in Alberta levied only at the federal level), and at the provincial and municipal level, property taxes.

Corporate income tax (CIT) is levied on the profits of the corporation at a general rate of 19% federally and 10% provincially. Recognizing the expense of exploration and development associated with earning income from the resource, the *Income Tax Act (Canada)* allows for the deduction of these expenses. Over the past ten years, corporate income tax has accounted for an average of 9.2% of total revenues for the Government of Alberta.

The amount of federal, provincial, and municipal tax revenue generated by activity in each of the natural gas and conventional oil sectors is difficult to determine given that income reported is generally not attributable to the activity specifically in these sectors (for example corporate income tax is levied on the profits of a corporation not on the profits from natural gas extraction). However corporate income tax revenue is available by industrial classification. Alberta's CIT net cash receipts from the upstream oil and gas industry (including oil sands) reached \$1.2 billion or

30% of all corporate income tax net cash receipts in 2008-09, reflecting the high prices for energy in that year. The share of the contribution from this sector to overall provincial corporate income tax revenue has varied over the years reflecting in part changes in price, costs and the general profitability of the industry, as well as the growth in other sectors of the economy. In the 12 year period from 1986 to 1997, natural gas and conventional oil sectors accounted for 28% of the assessed Alberta tax payable (which excludes the Alberta Royalty Tax Credit), while in the subsequent 10 year period from 1998 to 2007 the share dropped to 16%.

Estimating the industry's contribution to Alberta's personal income tax revenues, which accounted for an average of 20% of total provincial revenues over the past 10 years, is complex. Since labour income accounted for 72% of total personal income over the past 10 years, and the labour income associated with the industry accounted for an average of around 10% over the same period, a rough calculation suggests that the industry contributes around 7% of provincial personal income tax revenues.

LAND SALES

Crown leases (land sales) are also a contributing factor to government's revenues. Land sales are public offerings or sales for the right to explore for and recover the natural gas and conventional oil found on specific parcels of lands. The highest bidder for each parcel of land is issued an agreement granting the exploration and development rights; however the Crown retains ownership of the resources¹¹. As indicated in Figure 5 land sales experienced a tremendous jump in 2005-06. They then returned to previous levels in the period following (2007 – 2008). In 2009-10 land sales declined by more than 50%. While this decline is relatively recent, it is concerning because land sales are a leading indicator of future activity.



Figure 5: Land Sales Revenues



¹¹ Source: <u>http://www.energy.gov.ab.ca/Tenure/882.asp</u>



Source: Data from Energy Economics: Understanding Royalties

3.2. Challenges in Developing Alberta's Resources

The energy industry is founded on the availability of natural resources and investment capital. Because they are depleting resources, industry is constantly challenged to find new reserves and production to offset natural production decline. Without investments, the industry cannot sustain or increase production and reserves, leading to rapidly diminishing revenues and activity. Capital spending in Alberta is dominated by the oil and gas industry. Since 1995, oil and gas investment has been responsible for about half of total non-residential capital spending in Alberta.¹² The investment / reinvestment of capital by the oil and gas industry is also critical to economic activity in Alberta.

The industry is capital intensive and characterized by long term investments, lengthy production cycles and highly specialized technology. The investment capital needed to continue exploration activities and deliver production outputs comes from individual oil and gas companies or from the financial sector. These companies then decide how and where to spend their capital. As the WCSB matures, the risks and costs that companies face in developing the resource increase, leading to the need for higher prices to achieve an acceptable return.

¹² Source: Statistics Canada Survey of Public and Private Investment Intentions, February 2009.

Risk

Broadly speaking, Alberta's oil and gas industry incurs substantial risk through upfront investments in making bonus bids, exploration, drilling and the associated costs. Factors that impact risk in the business include price volatility, geological opportunities, production, capital risk and cost. The risk of prices not meeting expectations and expected production failing to materialize makes profits from exploration and development of natural gas and conventional oil uncertain. The primary indices we use in this section to discuss the level of risk are industry revenue levels and return on equity.

PRICE

One of the primary factors impacting the oil and gas industry is energy prices.¹³ Historically, oil and gas prices have seen a high degree of variability. A commodity based industry is characterized by price volatility. Figure 6 clearly depicts that over the past decade, both natural gas and conventional oil prices have seen unprecedented volatility, reaching record levels. When prices are high, industry is encouraged to build more capacity, which in turn leads to a surplus in supplies and prices fall. Falling prices will spur demand and restrict supply, leading to a new cycle of high prices. Recent low natural gas prices are also impacted by the unlocking of vast new supplies of natural gas from unconventional sources. This is seen as a fundamental change for the natural gas sector that will have a long-term moderating impact on natural gas prices.



Figure 6: Natural Gas and Crude Oil Prices 2000 – 2009 Source: Canadian Association of Petroleum Producers, 2009 Statistical Handbook



¹³ Source: Mansell, Robert and Schlenker, Ron (2006). *Energy and the Alberta Economy: Past and Future Impacts and Implications*. Institute for Sustainable Energy, Environment and Economy.

GEOLOGICAL RISK

Oil and gas reserves generally deplete at a rate of $\sim 30\%$ or more a year¹⁴. This leads to constant pressure to maintain and/or increase production. A key determinant of company success is the ability to increase production and build reserves. The larger the company, the bigger the challenge is to offset the decline and grow production and revenues.

Until now, the vast majority of Alberta's production has been conventional reserves. Technology has enabled the industry to find and develop new sources of production from existing reserves or new unconventional resources such as shale gas and oil sands. This has provided the industry with a new sense of optimism for Alberta's resource potential.

PRODUCTION & CAPITAL RISK

Once a reservoir is found, the next challenge is to produce the reservoir. Each formation is unique and it can take years to optimize the production. New technology can take decades to perfect. Failure is a real risk. The development cycles for a new project can take years, not only encompassing geologic and production risk, but capital risk as well. It may take several years of activity (exploration and development) and investment before commercial production commences. This requires funding the capital investments over many years before seeing revenue. The need to attract capital, equity and debt is crucial to the success of a company. The capital markets are extremely competitive, not only within the sector but among other industries as well. Given the uncertainty facing capital markets, volatile commodity prices, uncertain demand for energy and the recent periods of high cost, companies are struggling to perform.

Costs

There are several types of costs that the industry must consider and manage. They include exploration, development, operating, fiscal (royalties and taxes), and regulatory costs. Figure 7 demonstrates the challenge of increasing costs (excludes unconventional oil costs) that the natural gas and conventional oil sectors face. The industry must continually invest and re-invest to keep production from declining. As prices rise, costs rise in a depleting resource industry. Companies compete for inputs like land, drilling services, steel, production, engineering and construction services, driving costs up. The situation for natural gas and conventional oil is further exacerbated by the competition for inputs from oil sands projects.

¹⁴ Source: Assessing the Impact of Oil and Natural Gas Drilling in Alberta, Conference Board of Canada, December 2009



Figure 7: Total Costs of the Oil and Gas Industry Source: Canadian Association of Petroleum Producers, 2009 Statistical Handbook

RISK INDICATOR: REVENUE

A key risk to the industry is commodity prices and the impact can be seen in the historic revenue streams of the natural gas and conventional oil sectors. Upstream revenues in the oil and gas industry are a function of the volumes produced and the prices received for the various commodities sold. The importance of price in this formula makes it apparent that revenue levels tend to follow the trend in oil and gas prices. Revenues have doubled compared to what was being realized for most of the 1990's, due to the sharp rise in commodity prices.¹⁵ Total industry revenue in 2008 exceeded \$150 billion, followed by a severe drop in 2009, cutting revenues by almost half.¹⁶ The level of industry revenues is a barometer of industry investment activity and an indicator of economic activity in the province. The figure below charts the movement of crude oil and natural gas prices relative to industry revenues (excludes unconventional oil revenues).



 ¹⁵ Source: ARC Financial Corporation. (2006, March). Canadian Upstream Oil and Gas Industry Financial Performance Outlook
 2006-2008. A Study Prepared for the Canadian Association of Petroleum Producers . Calgary, Alberta, Canadap20
 ¹⁶ Source: Canadian Associate of Petroleum Producers Data to 2009, ARC Financial 2009 preliminary estimate



Figure 8: Natural Gas and Conventional Oil Revenues 2000 – 2009 Source: Canadian Association of Petroleum Producers, 2009 Statistical Handbook

RISK INDICATOR: RETURN ON EQUITY

Return on equity (ROE) measures profitability of the industry on shareholders capital.¹⁷ Although it appears that ROE has experienced a strong recovery since the late 1990s, it has actually lagged the rapidly rising prices. This can be attributed to a more rapid rise in costs as compared to prices. This concept is clearly demonstrated in Figure 9 (includes unconventional oil).

To illustrate the volatility of results that exists in the oil and gas business today, ROE's of 200 companies' for the past 7 years was tabulated. There is significant variation in the results over time and in a given year. In 2008 alone, a year of strong commodity prices, of the 200 companies, only 50% had a positive return¹⁸.

 ¹⁷ Source: ARC Financial Corporation. (2006, March). Canadian Upstream Oil and Gas Industry Financial Performance Outlook
 2006-2008. A Study Prepared for the Canadian Association of Petroleum Producers . Calgary, Alberta, Canada p41
 ¹⁸ Source: Canadian Association of Petroleum Producers 2009 Statistical Handbook

Project Committee Final Report to the Alberta Department of Energy On Alberta's Natural Gas & Conventional Oil Investment Competitiveness February 16, 2010





4. COMPETITIVENESS FRAMEWORK

4.1. Competition for Investment

Alberta competes with other jurisdictions to attract the investment necessary to realize the potential of its natural gas and conventional oil resources and generate substantial economic benefits. The industry runs on investment. The nature of exploration and development in the energy industry is that capital is invested to find and produce the oil and gas. Revenue is only realized when the production of oil and gas begins. Continual investment and re-investment is required to keep production from declining.

The sources of capital include reinvestment of cash flow from Alberta projects, and capital "imported' from outside Alberta through investors or companies who choose to come to Alberta.

When the financial sector and natural gas and conventional oil companies consider investment among the opportunities available to them they assess the relative merits of the locations of the investment opportunities. Each jurisdiction has public policies that affect the investment decisions. Investors seek the best return considering the risks. Public policy is a significant factor in the comparison of investment opportunities.

Alberta can and should aim for an increased share of capital spending by oil and gas companies in North America. There are excellent resource opportunities in this province, with potential for significant wealth creation and economic benefits to be enjoyed by all Albertans.

4.2. Influences on Investor Decisions

Many factors impact investor confidence and influence how and where oil and gas companies invest their capital. They also determine the manner in which jurisdictions compete to attract investment. Investment is future focused and is based on investors' perceptions of factors impacting potential economic return.

Investors assess opportunities on the relative attractiveness of the economic return, which is the result of interaction between global commodity prices, risks, resource potential, capital and operating costs and government share¹⁹. When factors such as resource potential and costs are relatively similar, investment decisions by companies and investors are impacted by the perceived business climate in the jurisdiction. Jurisdictions that are home to government initiatives and policies that support industry activity and development of innovative technology are perceived as having an attractive business climate.

The following are five categories of factors jurisdictions compete on to attract investment. This framework will also be used to assess Alberta's competitive situation relative to other jurisdictions in this report.

¹⁹ Source: IHS Cera, (2009, Dec). Well Cost Comparison Alberta Competitiveness. A Study Prepared for the Alberta Department of Energy. Cambridge, Massachusetts, USA.

Geographic Features

- *Geology and resource potential.* A critical consideration for investors in natural gas and conventional oil is the potential to find and develop high producing wells. Advancements in technology can impact resource potential and create new opportunities;
- *Geography and climate.* Location from market and related transportation costs influence investment decisions. Climate is also a factor because it impacts costs; and
- *Cost to explore and produce the resources.* There are several types of costs companies must consider and manage in different jurisdictions. They include exploration, development, operating, fiscal (royalties and taxes), and regulatory costs. The oil and gas industry also requires extensive infrastructure to produce and transport resources making jurisdictions with established infrastructure more attractive.

Fiscal Regime

- *Fiscal policy framework: stability and predictability.* Investor confidence is directly impacted by stability and predictability of fiscal policy because investment is future focused and is based on investors' perceptions of factors impacting potential economic return. Unexpected changes to fiscal policy or perceived instability can negatively affect a jurisdictions ability to attract investment;
- *Royalties.* Having the lowest royalty burden does not necessarily make a jurisdiction more attractive for investment. The timing of when royalties are paid to governments and maximum royalty rates impact investment decisions; and
- *Taxes.* Taxes are a factor that companies consider because they add to the overall cost of doing business in a jurisdiction.

Regulatory Regime

- *Regulatory structure.* Investors consider simple regulatory structures more attractive because they are easier to understand and navigate;
- *Effective regulatory policy.* Effective regulatory policy is critical to ensuring good environmental conservation and safety practices. An attractive policy framework balances necessary regulatory requirements with an understanding of the risk and probability of incidents, relying in precedent and simplicity. Companies prefer to invest in jurisdictions where regulatory policy enables sustainable industry activity, development and use of innovative technology; and
- *Efficient regulatory approvals process.* The regulatory approvals process can add time and expense to natural gas and conventional oil projects. Jurisdictions with efficient processes are more attractive.

Technology & Innovation

Support for development and use of innovative technology. Technology is required by companies to improve recovery of conventional resources, access unconventional resources and address impacts on the environment and climate. Government support for technology makes a jurisdiction more attractive for companies to invest in.



Business Climate: Leadership & Partnerships; Communication & Education

Partnership between industry and government. Mutual and productive partnerships between industry and government are an important consideration for companies investing in a jurisdiction because they lead to increased common understanding and knowledge, and effective government policy and initiatives.

4.3. Competing Jurisdictions

Recognizing that oil and gas companies and the investment community have opportunities nationally and internationally to invest, the Project Committee identified competing North American jurisdictions. Alberta has a diverse resource base including conventional and unconventional gas and conventional oil. Identification of competing jurisdictions was based on whether the jurisdiction has like resources to Alberta and determining if a given play is currently attracting significant investment.

Within Canada, British Columbia has recently unlocked vast quantities of unconventional natural gas (shale gas) that is competing with Alberta's natural gas sector. Saskatchewan competes with Alberta in the conventional oil sector.

Alberta also competes with jurisdictions within the United States that have conventional and unconventional natural gas and conventional oil²⁰. In particular, several jurisdictions in the United States have large quantities of shale gas that provide aggressive competition for Alberta's natural gas. In this report jurisdictions in the United States are compared collectively, rather than individually, to Alberta.

U.S., B.C. and Saskatchewan's royalty systems were compared on a systematic basis to determine the competitiveness of Alberta's system. However comparisons of regulatory, technology and business culture were not originally in scope for the ICS. Through stakeholder feedback it is apparent that these factors are significant issues affecting Alberta's investment competitiveness and require further study.

²⁰ The Investment Competitiveness Study project committee looked at the following United States jurisdictions: Texas, Wyoming, Pennsylvania, Louisiana, New Mexico, California, Montana, and Colorado. Each jurisdiction has one or more like resources to Alberta.

5. GEOGRAPHIC FEATURES

Alberta has a diverse and rich resource base including natural gas, conventional oil, oil sands and coal. The following section describes the nature of Alberta's geology and resource potential, geography and climate, and costs to explore and produce its' resources.

Where possible, there are comparisons to competing jurisdictions. While Alberta and other jurisdictions cannot change their geology or geographic location, the nature of the resources is still an important competitiveness consideration. By understanding the resource potential and challenges of exploring and producing the resources, public policy can be modified to improve competiveness.

5.1. Natural Gas

Alberta has vast untapped deposits of natural gas. Geological assessment shows that Alberta possesses 87 trillion cubic feet (Tcf) of recoverable, conventional gas deposits and it has many multiples of this in unconventional gas²¹ potential²².

Alberta's conventional natural gas business is dealing with new challenges. Advancements in horizontal, multi-fractional technology has facilitated the emergence of unconventional gas, particularly tight and shale gas, in the United States and British Columbia. This has added tremendous volumes²³ of new natural gas to North American supplies²⁴. This means that the United States, Alberta's primary export market, has gone from a position where it was necessary to secure supplies from Alberta to a position where Alberta's natural gas must now compete with abundant indigenous United Stated supplies. These include Haynesville, Fayetteville and Marcellus shale's which are closer to markets. In addition, shale gas development in British Columbia offers further competition for Alberta (see Figure 10).



²¹ For the purposes of this report unconventional gas refers to shale gas, coal bed methane (CBM), and tight gas.

²² Source: Canadian Association of Petroleum Producers (CAPP)

 $^{^{23}}$ New North American recoverable natural gas reserve base is estimated to be ~ 500 Trillion cubic feet (Tcf), compared to ~ 296 Tcf previously. The resource base is estimated to be even higher. Source: http://www.cga.ca

²⁴Source: Advanced Resources International, Inc. (2009, Nov). USA Gas Shale Plays: Evaluation and Implications for Alberta's Gas Shale Development. Arlington, Virginia, USA.



Figure 10: Major New Natural Gas Supply Basins Source: 'Modern Shale Gas Development in the United States: A Primer', U.S. Department of Energy

Expected increases in supply are further intensified with the potential of global liquefied natural gas (LNG). Even with global economic recovery, it is widely believed by industry and investors that natural gas prices will range from USD\$4.00 to \$7.00 per thousand cubic feet (Mcf) in the foreseeable future. This creates a challenging environment of extended low commodity prices and a level of supply/market competition which did not previously exist for Alberta.

The Alberta component of the Western Canada Sedimentary Basin (WCSB) is considered mature because of the extent to which the basin has been explored and geologically mapped and the substantial amount of production that has occurred. The relatively remote location and cold climate of the WCSB also impacts exploratory and development perspectives for conventional gas in Alberta because there are increased costs related to transportation and there is a shortened drilling season. Conversely, jurisdictions in the United States are closer to major markets reducing transportation costs.

The project committee investigated competing jurisdictions' findings, development, and operations costs (including transportation, and fiscal and regulatory costs). Industry stakeholders who operate in Alberta and the United States pointed to the comparatively higher capital and operating costs in Alberta as a reason for shifting investment to the United States. According to analysis conducted by IHS CERA, a natural gas well in Alberta with identical technical specifications is between 12% and 14% more expensive to drill than in the United States (see Figure 11).

Figure 11: Comparison of Natural Gas Well Costs between Alberta and the United States, 2009



Source: IHS Cera, Alberta Department of Energy

When compared with British Columbia and Saskatchewan, however, Alberta is seen to enjoy some cost advantages²⁵. This is because of more established and extensive infrastructure, including access to oil and gas services transportation access, roads, rail and pipelines in Alberta.

An important consideration for all Western Canadian jurisdictions is the cost of transporting natural gas to markets in the United States. Decreases in the level of drilling activity lead to reduced production volumes, resulting in increased transportation tolls and placing more pressure on Alberta's competitiveness²⁶. The current transportation toll is not insignificant at approximately CAD\$1.50 per Mcf.

The emergence of large new natural gas sources in the United States has fundamentally changed the supply in the market. Demand creation becomes an obvious consideration Alberta. One external factor is the desire to shift to cleaner burning fuels. Industry stakeholders suggested that the Alberta government can provide support for the transition to natural gas for electricity production and transportation fuels. This could provide near term reductions in carbon gas emissions and create demand for Alberta's natural gas in the market.

5.2. Conventional Oil

In terms of Alberta's supply of conventional oil, the Western Canada Sedimentary Basin (WCSB) is relatively mature, meaning that the large fields have already been developed and the remaining



²⁵ See *Appendix B* for the Investment Competitiveness Study Technical Analysis Report

 $^{^{26}}$ Tolls are based on spreading the costs of the pipeline over the volumes transported, therefore as volumes decrease the per unit cost increases.

conventional pools are smaller with declining well productivity. Conventional oil production in Alberta peaked in the mid 1970's, but substantial potential still remains in Alberta's oilfields. Figure 12 shows that most of Alberta's oil remains in the ground. Currently only about 29% of Alberta's oil in place (OOIP) is expected to be recovered, leaving billions of barrels of opportunity, if the right technology is developed and adopted. Alberta has approximately 3.7 billion barrels of remaining recoverable oil using existing technologies. Oil and gas companies that participated in the technical analysis component of this study suggested that Alberta may have several oil opportunities, such as Pembina Cardium, which may rival Saskatchewan's Bakken play. The Bakken oil field in south east Saskatchewan is a significant conventional oil play in Canada and continues to generate strong interest as a result of the use of existing (horizontal drilling and multi-fractional) technology²⁷.

In Alberta, only a small increase (i.e. 8 percent) in the recoverable portion of the initial oil in place could easily double the reaming recoverable volumes. *Ramping Up Recovery*, a 2006 investigation into the recoverability of oil and gas in the Western Canada Sedimentary Basin (WCSB), suggested that in Alberta an incremental 3.6 billion barrels of conventional oil are recoverable simply through a more advanced and thorough application of existing technologies. Further extension of this oil potential is also possible with new technologies, thus allowing access to oil in lower permeability and porosity formations which were previously ignored.



Figure 12: Alberta's Conventional Oil Reserves (2010) Source: Alberta Department of Energy, Alberta Energy Resources Conservation Board

Oil is a globally traded commodity with prices determined by world oil supply and demand. Fewer conventional oil sources, anticipated recovery of the global economy and expected demand growth in developing countries such as India and China mean that oil prices will remain strong²⁸.

²⁷ Source: Canadian Association of Petroleum Producers (2009, June). 2009-2025 Canadian Crude Oil Forecast and Market Outlook.

²⁸ Sources: U.S. Energy Information Agency; the International Energy Agency; and ARC Financial.

Currently, word demand for oil is approximately 88 million barrels per day²⁹. With the maturing of the conventional oil resource basin in Alberta the use of technology will be needed to increase the future prospects for incremental reserves and to slow the annual production decline. The same horizontal drilling and multi-fractional technology that is revolutionizing the natural gas sector, along with other technologies are offering exciting new prospects for increased conventional oil well productivity and recovery.

A competitive strength of Alberta is that its conventional oil resources are extremely well understood geologically, predominately contain high value lighter crude oil, and have substantial infrastructure supporting them, including well bores, access roads, and pipelines.

For conventional oil, the integration of technological advancements and economic underpinnings provides opportunity to create economic value, maintain economic activity across the province, and do so in a way that minimizes environmental footprint.

-32



²⁹ Source: International Energy Agency

6. FISCAL REGIME

6.1. Fiscal Policy Framework: Stability & Predictability

The fiscal regime, which includes royalties and taxes, is an important policy tool that can shape economic and resource development to improve competitiveness. Throughout the study, there was strong consensus from natural gas, conventional oil and financial sector stakeholders that unless changes are made to the present fiscal regime for oil and gas development in Alberta, investment will continue to decline in the province.

The project committee noted that industry and investors need to have confidence in the long term stability of the jurisdiction in which they operate. Instability in the royalty framework, temporary incentives clauses, unscheduled reviews and tax changes all serve to create uncertainty about the fiscal regime.

If decisions are made through a more predictable and consultative process between government and industry, and on a point-forward basis, the adverse impact on already invested capital by industry will be mitigated. Change is expected, but should be predictable and planned.

Recent changes to Alberta's fiscal regime, in particular, introduction of Alberta's Royalty Framework (ARF) on January 1, 2009 and subsequent modifications including temporary transitional programs and incentives, have eroded investor confidence. While investors recognize temporary programs may be necessary as levers to mitigate low commodity prices, continue activity, and encourage increased oil and gas recovery and encourage technological innovation, there is a preference for fewer programs. Investors are looking for a royalty program, that is simpler, more flexible, predictable, and not in constant need of temporary programs.

6.2. Royalty

Royalties are an important part of Alberta's overall fiscal framework. They ensure that Albertans, represented by the government, receive a portion of the benefits arising from the development of the province's resources. They are also an important policy tool that influence investment decisions.

Alberta's Royalty Framework (ARF) was introduced on January 1, 2009. Royalty rates are determined separately for natural gas and conventional oil. Natural gas royalties are set on a sliding scale with separate royalty formulas for price, production and depth. Conventional oil royalties are also set on a sliding scale, but only with separate royalty formulas for price and production. These individual components are aggregated to determine the final royalty rate on a per well basis. Royalty rates in Alberta for both natural gas and conventional oil can range from a minimum of 0% to a maximum of 50%.

Included in the ARF for natural gas and conventional oil are a number of permanent and temporary programs that are designed to either reduce the calculated royalty rate on a well or provide the operator of a well with a royalty credit/reduction.

Natural Gas

In the context of a changing environment for natural gas, the project committee undertook a comprehensive review of Alberta's Royalty Framework (ARF) compared to British Columbia (BC) terms, Saskatchewan (SK) terms, and the United States (US) terms³⁰. This review used data that was validated by industry companies and corroborated by third party consultants³¹. The work supports industry and investor views that the ARF negatively impacts Alberta's investment competitiveness³². More specifically that:

- The maximum royalty rates are higher than those of competing jurisdictions; and
- The royalty rates at the front end of production where investor risks are higher, and before costs have been recovered, are higher than those of other jurisdictions.

Once existing incentive programs expire, Alberta's maximum royalty rates will be significantly higher than those of other jurisdictions (see Table 2). For high producing typical conventional gas wells at \$6.00 per Mcf, the maximum royalty rates for other jurisdictions are in the range of 24 % to 29% percent, compared to 35% in Alberta. At \$8.00 per Mcf, Alberta's royalty rates increase dramatically to 42%, compared to 24% to 31% for other jurisdictions.

Iumisdictions	Maxim	Maximum Natural Gas Royalty Rates	
JULISUICUOIIS	\$6.00/Mcf	\$8.00/Mcf	
ARF	35%	42%	
SK	29%	31%	
BC	25%	25%	
US	24%	24%	

 Table 2: Comparison of Maximum Natural Gas Royalties in Different Price Scenarios
 Source: Alberta Department of Energy

The royalty rates applied to highly productive wells, and the associated reduction in profitability during periods of high prices, have a significant impact on investment decisions. The investment returns from highly productive wells are seen as an important offset to lower or non productive wells encountered in normal field development.

While the negative impact on competitiveness from the higher maximum royalty rates in Alberta are straight forward to understand, the impact of front end rates requires further illustration and explanation. An effective mechanism to mitigate investment risk is to recover spent capital as soon as possible. This is particularly important in the oil and gas business given the rapid decline in initial well productivity and the volatility of commodity prices. Recuperating investments

³⁰ Note that United States terms include royalty and severance taxes.

³¹ See Appendix B for the Investment Competitiveness Study Technical Analysis Report and details on third party consultants. ³² The study recognizes that natural gas royalties are complex with various factors such as commodity price, production volume, time and depth contributing to their calculation. Given this complexity, a wide range of curves are possible. This section of the report selected royalty figures and curves based on determination of typical wells and the expected range of prices in the foreseeable future. See Appendix B for the Investment Competitiveness Study Technical Analysis Report and additional details on natural gas royalties.

sooner also allows companies to invest in further resource exploration and development, and innovative techniques and technology to enhance recovery.

Figure 13 illustrates that rates under the ARF for \$6.00 per Mcf are lower in the middle of a typical well's production cycle, but higher at the beginning of production. Note that the normal production profile of a well would be a rapid decline during first year of production. Given the rate sensitivity of Alberta royalties, this leads to a high initial royalty rate, while providing for a lower royalty when production is lower. While the rates over the life of the well are comparable, the high rates in the early stages of production when production is higher have a disproportionally negative impact on investment returns and competitiveness. Figure 14 shows that front end rates are magnified at higher prices.

Figure 13: Illustration of Royalty Rates – Natural Gas (Conventional Well at \$6.00/GJ) Source: Alberta Department of Energy





Figure 14: Illustration of Royalty Rates – Natural Gas (Conventional Well at \$8.00/GJ) Source: Alberta Department of Energy

To understand natural gas economics, the project committee looked at typical wells for 14 natural gas plays in Western Canada. The results indicate that while there are attractive opportunities for conventional gas in Alberta, there are several conventional gas plays that are not profitable on average, using technology that is currently employed³³. Investment decisions are not based on average industry returns, rather the expectation that one can achieve top quartile performance. As noted earlier, over 50% of 200 public companies in the oil and gas industry did not achieve a positive ROE. The reality of these risks points to the importance of Alberta's fiscal regime recognizing the challenges facing industry. This also reveals the significance of technological innovation and adoption in improving resource recovery and profitability.

Conventional Oil

The project committee also undertook a comprehensive review of Alberta's Royalty Framework (ARF) compared to British Columbia (BC) terms, Saskatchewan (SK) terms, and average United States (US) terms for conventional oil³⁴. The work supports industry and investor views that ARF negatively impacts Alberta's investment competitiveness in ways similar to natural gas³⁵:

• The maximum royalty rates are higher than those of competing jurisdictions; and



³³ See *Appendix B* for the Investment Competitiveness Study Technical Analysis Report and additional details on natural gas economics.

³⁴ Note that United States terms include royalty and severance taxes.

 $^{^{35}}$ The study recognizes that conventional oil royalties are complex with various factors such as commodity price, production volume, and time contributing to their calculation. Given this complexity, a wide range of curves are possible. This section of the report selected royalty figures and curves based on determination of typical wells and the expected range of prices in the foreseeable future. See *Appendix B* for the Investment Competitiveness Study Technical Analysis Report and additional details on conventional oil royalties.

• The royalty rates at the front end of production where investor risks are higher, and before costs have been recovered, are higher than those of other jurisdictions.

Maximum conventional oil royalty rates in Alberta are substantially higher than other jurisdictions (see Table 3). For typical high producing conventional horizontal light oil wells at \$65.00 per bbl, the maximum royalty rates for other jurisdictions are in the range of 18% to 22% percent, compared to 37% in Alberta. The difference is even more pronounced for higher price conditions. At \$120.00 per bbl, Alberta's royalty rates increase dramatically to 49%, compared to 19% to 22% for other jurisdictions. As with natural gas, the high royalty rates applied to productive oil wells and associated removal of upside profitability have a significant negative impact on investment decisions. This is especially true for conventional oil because high oil prices are anticipated in the future.

The current royalty system for oil does not fully recognize the costs associated with new technology, hindering the application of innovation technology.

Inviadiationa		Maximum Royalty Rates	
Jurisalcuons	\$65.00/bbl	\$120.00/bbl	
ARF	37%	49%	
US	22%	22%	
BC	18%	18%	
SK	18%	19%	

 Table 3: Comparison of Maximum Conventional Oil Royalties in Different Price Scenarios

 Source: Alberta Department of Energy

The conventional oil business is risky in some ways that are similar to natural gas. Companies and investors are looking for the fastest possible repayment of the capital invested. There are also differences. Development of mature conventional oil and enhanced oil recovery projects have a high risk profile as the capital expenditures needed in the early stages of development and the operating costs throughout the life of the project are high. Conventional oil infrastructure in Alberta is aging. The oil infrastructure needs to be maintained or replaced in anticipation of increased usage from the application of new technology. The industry needs to achieve an appropriate level of financial strength and/or be incented to make these additional investments.

An additional risk is that actual oil production may be considerably lower than forecasted, negatively impacting the profitability of the project. Based on industry information, a typical conventional oil well, whether it is newly drilled or a result of enhanced recovery methods, would achieve peak production within the first 3 to 6 months. After these initial high rates, production rates usually drop off very quickly.

Recovering investments sooner also allows companies to invest in new resource exploration and development, and innovative techniques and technology to enhance recovery, especially in a mature oil basin, such as Alberta's. Enhanced oil recovery (EOR) techniques, such as steam and chemical injection wells, are expensive and risky. Alberta's conventional oil royalty system also does not account for the substantial risk and higher upfront costs of employing these new technologies.

Project Committee Final Report to the Alberta Department of Energy On Alberta's Natural Gas & Conventional Oil Investment Competitiveness February 16, 2010

Figure 15 illustrates that royalty rates under the ARF for \$65.00 per bbl are higher at the beginning of production when risks are higher than other jurisdictions. This has a disproportionally negative impact on investment returns and competitiveness. Figure 16 shows that front end rates are magnified further at higher prices.









Figure 16. Illustration of Royalty Rates – Conventional Oil (Horizontal Well at \$120/bbl) Source: Alberta Department of Energy

If conventional oil activity increases in Alberta, the province will benefit from increased land sales, royalties and economic activity. Conventional oil projects operate on a smaller scale and offer more accessible opportunity for smaller companies. This also helps to maintain the diversity of companies within Alberta's energy sector.

6.3. Taxes

Taxes contribute to the overall fiscal burden placed on companies and influences investment decisions. The taxes include, at the provincial and federal levels, corporate and personal income tax, indirect taxes (e.g., federal GST in Alberta), payroll taxes (in Alberta levied only at the federal level), and at the provincial and municipal level, property taxes.

Aspects of the taxes levied in Alberta are viewed positively by investors. The tax system in Alberta is profit based and allows for partial transfer of loss due to failure to projects that succeed. The flow-through share program also allows accelerated transfer of exploration tax credits by essentially creating a medium to transfer these credits as they are created.

According to industry stakeholders, there are some aspects of the tax system require consideration. For example, rising municipal property taxes in Alberta have been cited as a concern.

6.4. Technology

The fiscal regime, including design of the royalty framework and tax incentives, can be used to stimulate development and use of innovative technology to improve recovery of resources and unlock potential resources, such as shale gas. Industry seeks to develop and apply innovations "on the ground" to enhance recovery. These techniques can add time, expense and risk to the project. This can add extra cost and risk associated with developing and implementing new technology. By lowering the front end of the royalty curve, capital costs can be recovered by investors more quickly and investment can be deployed into developing technology. Adjustment to the tax treatment of projects involving innovation and technology is another mechanism for encouraging technology.



7. REGULATORY REGIME

Stakeholder feedback indicates that the regulatory environment is as important as the fiscal regime when examining Alberta's competitiveness relative to other jurisdictions. For the natural gas and conventional oil sectors, the following provides a high level summary of Alberta's regulatory structure, policies and approvals processes.

Alberta's oil and gas development happens in areas that draw significant attention because of drilling density, the impact on the environment and/or because of proximity to the province's growing population. This has heightened regulatory processes with the intent of ensuring good environmental conservation and safety for Albertans.

Though Alberta maintains high standards of safety and environmental protection, the *Fraser Institute 2009 Global Petroleum Survey* indicates that resource developers perceive Alberta as having one of the least attractive regulatory regimes in North America. Further work is required to fully understand and compare Alberta's regulatory regime to competing jurisdictions, but according to the Fraser Institute and stakeholder feedback some of the reasons that Alberta's regulatory regime is considered deterrence for investors are³⁶:

Regulatory requirements do not clearly recognize risk and probability;

High compliance costs;

Inefficient and ineffective processes; and

High conflict resolution costs.

The project committee recognizes that there are several Government of Alberta initiatives and projects currently underway or starting that are related to the regulatory regime and resource management. Some of the initiatives begin to address regulatory issues identified in this report and include the:

Resource Management Re-engineering Project.

- This cross-ministry initiative led by the Department of Energy is reviewing and developing recommendations and implementation strategies to resolve gaps, overlaps, inconsistencies, and duplication in Alberta's strategic provincial policies, with a focus on the oil and gas sector. The intention is to help position Alberta as a location of choice for the oil and gas industry and as a leader in economic, environmental, and social stewardship.

Regulatory Alignment Project.

- This project was established to modernize and further strengthen regulatory delivery for upstream oil and gas, including in-situ oil sands. In so doing, the Project will realize its

³⁶ Sources: Fraser Institute 2009 Global Petroleum Survey; and Investment Competitiveness Study Stakeholder Input.

vision of responsible social, economic and environmental stewardship through an effective, efficient, adaptive, and integrated regulatory system that recognizes Alberta's position as a leader for upstream oil and gas development.

7.1. Regulatory Structure

Stakeholder feedback from oil and gas companies and the investment sector indicates that the regulatory structure in Alberta is complicated and difficult to navigate. There are numerous provincial government ministries involved in regulating Alberta's oil and gas industry, including Alberta Energy, Alberta Energy Resources Conservation Board, Alberta Environment, and Alberta Sustainable Resource Development. This means that oil and gas companies must deal with multiple regulatory agencies when seeking project approvals or deploying new technologies.

7.2. Regulatory Requirements

Alberta is recognized as maintaining high standards of safety and environmental protection, but an issue raised by stakeholders is that current requirements do not clearly understand the risk and probability of incidents. A development approach is needed to enable valid concerns to be addressed, while acknowledging that proven safe practices can be used without having to rejustify the benefits of these methods. There should be more reliance on precedent. When defined areas and methods have been studied and approved for development this precedent should guide future approvals. The cost of repeating the same review for the same type of site or method could alternatively be used to review and assess high risk or new areas for development.

7.3. Regulatory Process

Alberta's current regulatory processes and associated costs are identified by stakeholders as a reason for investing in competing jurisdictions such as British Columbia and Saskatchewan. British Columbia and Saskatchewan are seen by investors as having a more efficient regulatory process while maintaining high standards of safety and environmental protection. The approvals process in Alberta was seen as more costly than its neighboring jurisdictions for several reasons, including the number of occasions in the process for intervention resulting in high conflict resolution costs, duplicate processes and delays in approvals.

7.4. Technology

The regulatory regime can impact the development and use of new technology. Recognizing that regulations must first ensure that the application of technology does not compromise the safety of Albertans and the environment, the regulatory system then needs to enable innovative technology. The system must be able to adapt to allow for the ongoing development and use of the new technology. This includes understanding the risk and probability of incidents related to new technologies. Stakeholder input indicates that this is an area that Alberta can improve to increase its attractiveness to investors.



8. TECHNOLOGY & INNOVATION

The natural gas and conventional oil sectors are in the midst of a technological revolution. Horizontal drilling and reservoir fracturing technologies are unlocking vast new natural gas supplies and have the potential to improve recovery of conventional oil. While these new technologies are costly they are offering exciting new investment opportunities and breathing new life into these sectors. Application of these technologies is further advanced in other jurisdictions.

The stakeholder consultation highlighted technology as a way for Alberta to improve its competitive advantage. Recognizing that technology is the key to unlocking resources in Alberta means that developing and deploying technology needs to be as easy as possible.

The discussion about technology and innovation has three elements to it:

- The innovation that happens "on the ground" that is mostly undertaken by industry;
- The introduction of new technology and innovative approaches into the regulatory system that is often difficult; and
- Strategic innovation and technology development that happens over a long time that involves the public and private sector.

Stakeholders emphasized that technology development in Alberta can be accelerated. In order to improve the application of innovative approaches and technology the fiscal system can provide relief for the extra cost and risk associated with doing new things. By lowering the "front end" of the royalty the upfront costs can be recovered by investors more quickly. Adjustment to the tax treatment of projects involving innovation and technology is another mechanism for encouraging technology.

The regulatory regime must be adaptable to new technology. Deployment is sometimes delayed by the regulatory systems. The first obligation is to ensure that the application of technology does not compromise the safety of Albertans and the environment. Once this has been determined, the regulatory system needs to be able to adapt to allow for the ongoing use of the technology. This could be accomplished though closer collaboration on pilot projects enabling rapid transfer of knowledge from the developer to the regulator.

Alberta invests in technology development and commercialization though its innovation system. Albert Innovates – Energy and Environment Solutions is a dynamic catalyst for developing innovative, integrated ways to convert our natural resources into market-ready, ecologically responsible energy. There are excellent examples of technology collaboration and development. With Alberta's well aligned innovation system industry and government can collaborate to indentify the priorities for investment and to improve mechanisms for knowledge translation and commercialization.

9. BUSINESS CLIMATE: LEADERSHIP & PARTNERSHIPS; COMMUNICATION & EDUCATION

According to both oil and gas companies and the investment sector the business climate of a jurisdiction plays a significant role in investment decisions.

Stakeholder feedback suggests that the business climate in Alberta has deteriorated, while both British Columbia and Saskatchewan have actively courted industry, modifying both fiscal and regulatory regimes to accommodate the development of resources. This has an impact on investment decisions by companies and investors, particularly when other factors, such as geological opportunity and cost, are relatively similar.

Leadership and Partnerships

An energy-focused culture, evident leadership, trusting relationships, consistent messaging and partnership between industry and government are important contributors to competitiveness. Investors and industry have more project opportunities than their capital budgets will support. This was especially true of some of the large companies operating in Alberta. Investment, intellectual capital and to some degree infrastructure are all mobile and will be deployed where the best returns can be realized. Consequently, there is a need for stability and support in Alberta to secure as much investment as possible.

As stewards of oil and gas resources in Alberta, the government is an important partner in energy development. The energy industry is the largest single contributor to Alberta's economy creating opportunities for prosperity, employment and social progress for resource owners. The fiscal and regulatory regimes of government can actively influence the success of the industry.

Throughout the stakeholder consultation, the project committee was advised that a key issue is for Alberta's government to rebuild trust with industry and the investment sector and develop a more positive business climate for the future. There was negative feedback about the New Royalty Framework and its implementation. Many stakeholders suggested that industry and government need to inform each other of issues affecting the oil and gas industry and work closely together in the formulation of regulatory and fiscal policy. This is critical for ensuring mutual understanding on issues and building capacity required to generate, implement and sustain competitive policies and regulations. This study, with its collaborative and transparent approach, is an example of how industry and government can work together.

Communication and Education

Companies operating in Alberta and the investment sector noted that it is important for the Department of Energy to communicate the *Provincial Energy Strategy* on a continued basis. Industry and government conduct their work in oil and gas under the scrutiny of Albertans, and audiences in Canada and internationally. Communicating more effectively with those who are concerned with the energy industry will improve the business culture in the province.



The oil and gas industry in Alberta makes significant contributions. These contributions include reclamations of land, advancements in technology, scientific research, exports of resources and knowledge. Understanding the global impact of the service sector, the significance of the junior sector in leading exploration programs; and the thought leadership in environmental management by the larger industry players are key aspects which should be communicated publicly.

Industry and the investment sector expressed concern about negative views many Albertans hold regarding the energy industry, particularly because the energy industry is a major contributor to government revenue and economic prosperity. Understanding the underlying concerns Albertans have about oil and gas, will lead to more collaborative approaches in the future.

Similarly, stakeholders stated that it is incumbent on industry to communicate regularly with government on new initiatives, issues and leading edge research technologies to advance Alberta's oil and gas industry. Balancing the positive impact of the contribution of oil and gas to Alberta's economy with the need for conservation and good sustainable practices in energy provides a well-rounded and educated perspective on energy.

10. THE CASE FOR CHANGE

Alberta's energy sector has given the province much to be thankful for. It continues to offer tremendous opportunities to achieve even more – for Albertans, for Canadians, and for all those Alberta continues to supply with the secure energy needed for the success of their economies. In good times it is possible to take success for granted. While Alberta has had many past successes, the province must be prudent enough to understand the changing world and plan for the future. This reality presents opportunities, it presents challenges, and it presents responsibilities.

10.1. Vision and Strategy

It is in recognizing past and current successes, and realizing that future success will come only with vision and a clear plan to achieve that vision, the Government of Alberta decided to create a new Provincial Energy Strategy in 2008³⁷. The project committee used the Strategy as the basis for the study.

The Strategy includes the goal that "Alberta will remain a global leader, recognized as a responsible world-class energy supplier, an energy technology champion, a sophisticated energy consumer, and a solid global environmental citizen." This goal acts as a point of reference for assessing Alberta's competitive position.

10.2. Assessment of Alberta's Competitive Position

Alberta has a rich history in the oil and gas business and has much strength related to the business including an abundance of natural resources, well established infrastructure, education system and research facilities, strong engineering and technical capabilities, and a robust service sector. Despite these strengths, an assessment of the competitiveness factors described in this report indicates that Alberta has lost its competitive edge. Changes must be made to improve Alberta's ability to attract investment and achieve the vision outlined above.

The following are key findings for each of the competitiveness factors that demonstrate that Alberta is no longer as competitive as it once was.

Nature of the Resources

Alberta's conventional gas is facing heavy competition. The emergence of United States and British Columbia unconventional gas and global LNG has increased supply and competition for markets, and is impacting commodity prices, that are expected to remain below USD\$7.00 per Mcf for the foreseeable future. Unconventional gas is also more economically attractive than conventional gas, creating increased competitive for investment capital;



³⁷ Alberta's Provincial Energy Strategy, 2008, Alberta Energy, Government of Alberta

- There is a need to develop new markets for Alberta's natural gas. Climate change concerns present an opportunity to develop natural gas markets as natural gas is seen as the cleanest hydrocarbon source of energy;
- Alberta has high capital and operating costs. These include physical, logistical and labour costs; fiscal terms; and regulatory burdens. If Alberta is not able to maintain delivery volumes, transportation tolls will increase, placing more pressure on industry profits for natural gas;
- The Western Canada Sedimentary Basin (WCSB) is mature with regards to exploring and developing conventional gas and conventional oil. However, there continues to be exceptional potential to apply innovative technology to improve recovery of conventional gas and access unconventional gas sources in Alberta. Also, advancements in enhanced methods of extraction, such as CO₂ enhanced oil recovery (EOR), will allow greater recovery and production of conventional oil. It is noted that there is substantial risk and costs in employing these new technologies. For example, enhanced recovery often requires investments in injection wells, injection fluids and fluid handling systems; and
- Alberta's conventional oil has the potential to be viable and provide excellent opportunities. However, it is price dependant and restricted by high royalty rates relative to other North American jurisdictions.

Fiscal Regime

- Alberta's fiscal regime is perceived as being instable and unpredictable by investors. The introduction of the New Royalty Framework (NRF) and subsequent changes eroded investor confidence in the stability and predictability of Alberta's fiscal regime;
- Alberta's royalty system negatively impacts investment competitiveness and industry profitability. When existing incentive programs expire, Alberta's maximum royalty rates and royalty rates at the front end of production are higher than other jurisdictions for both natural gas and conventional oil; and
- Alberta's taxes are competitive in certain areas, but investors indicate concern with some aspects of the tax system. Stakeholder input suggests that some improvements can be made to the tax system to improve costs and incent innovative technology.

Regulatory Regime

- Alberta's regulatory structure is perceived as complicated and difficult to navigate. Oil and gas companies are required to deal with multiple agencies and government ministries involved in Alberta's regulatory regime;
- Alberta's regulatory policy and requirements can be improved. Alberta's regulatory requirements are viewed by companies operating in the province not appropriately balancing necessary regulatory requirements with an understanding of risk and probability of incidents, and enabling sustainable industry activity and development and use of innovative technology; and
- Alberta's regulatory approvals process is inefficient. The existing regulatory approvals process Alberta adds time and expense to natural gas and conventional oil projects.

Technology & Innovation

Alberta needs to ensure support for development and use of innovative technology. Technology is required by companies in Alberta to improve recovery of conventional resources, access unconventional resources and address impacts on the environment and climate.

Business Climate: Leadership & Partnerships; Communication & Education

The partnership between industry and government has deteriorated in Alberta. Stakeholders indicated the business climate in Alberta can be improved to ensure a common understanding and knowledge of the business, and to develop effective government policy and initiatives.

Based on the findings, Alberta needs to address these issues to improve its' competitive position. Further evidence of the need to make changes is that there has been reduced in investment and industry activity in Alberta recently.

10.3. Evidence of Reduced Investment and Industry Activity in Alberta

Given the competitive environment Alberta finds itself in, the province is beginning to see reduced natural gas and conventional oil investment and activity. This is indicated by declines in land sales and capital investment which in turn impacts drilling activity and production.

While drilling activity is down in all jurisdictions and in some cases down even more in other jurisdictions than in Alberta, it is the change in land sale patterns – the precursor to future drilling activity that is of particular concern. When comparing Alberta's percentage of Western Canada land sales related to the natural gas and conventional oil sectors from 1999-2007 to 2008-2009 there is a significant decline from 67% to 26%, whereas capital investment in British Columbia land increased from 25% to 55% (see Figure 17).

-48





Figure 17: Percentage of Western Canada Land Sales (1999-2007 vs. 2008-2009) Source: Alberta Department of Energy - Province of British Columbia, Government of Saskatchewan

This poses a competitive threat on two levels. First, investors and industry have indicated that they are not confident in the future of Alberta given the current situation, and that British Columbia has a better environment for conducting business. Second, this shift in investment indicates an intention of industry to further invest in the activity necessary to extract the resources in British Columbia, allowing the province to reap the benefits of future development and production.

Industry investment in Alberta as a percentage of total expenditures in the WCSB is also declining and there is a general trend of capital movement from Alberta to British Columbia and Saskatchewan (see Figure 18). The decline in capital investment pre-dates the introduction of Alberta's New Royalty Framework (NRF). This may be an indication of the "non-fiscal" factors (e.g. regulatory) that are pointing to a loss of competiveness.



Figure 18: Investment in Alberta as a Percentage of Total Western Canada Expenditures (2004-2008) Source: Alberta Department of Energy - Province of British Columbia, Government of Saskatchewan

It is also important to note that there are likely two sources of the reduction in investment. On one hand most junior companies who only operate in Alberta are either not investing at all or they are reducing their investment during these tough economic times; whereas well capitalized companies, mid-sized or majors, are focusing their investment decisions outside of Alberta, resulting in capital migrating out of the province.

10.4. Consequences of Inaction

As industry activity deteriorates there are serious risks for Alberta. The natural gas and conventional oil industry is an important portion of Alberta's economy. At its peak in 2005, the natural gas and conventional oil sector in Alberta contributed over CAD\$27 billion to provincial and federal revenues through royalties, land sales and taxes³⁸. These revenues do not include taxes paid by oilfield service companies and all spin-off economic activity coming from upstream exploration, development and production – contributions that are estimated to be ~30% of Alberta's economy³⁹. Consequently, decreased industry activity and investment impacts Alberta through:

Continued decline in investment, causing continued decline in industry activity. Capital flows cyclically into and out of the oil and gas economy. How well the economic cycle is timed and executed determines profitability of the industry.⁴⁰ As investment declines, industry activity weakens and economies of scale decline leading to increased costs that further challenge Alberta's competitiveness.



³⁸ Source: ARC Financial Corporation. (2006, March). Canadian Upstream Oil and Gas Industry Financial Performance Outlook 2006-2008. *A Study Prepared for the Canadian Association of Petroleum Producers*. Calgary, Alberta, Canada.

³⁹ Source: Alberta Finance and Enterprise.

⁴⁰ Source: ARC Financial Corporation. (2006, March). Canadian Upstream Oil and Gas Industry Financial Performance Outlook 2006-2008. *A Study Prepared for the Canadian Association of Petroleum Producers*. Calgary, Alberta, Canada.

For example, if natural gas production continues to decline this will result in reduced flows on the export pipelines, contributing to increased transportation costs to move Alberta's resources to markets and exacerbating an already serious competitive challenge;

Idle and aging infrastructure. Adequate, cost-effective infrastructure (e.g. pipelines, roads, services, etc.) is critical to Alberta's energy success;

For example, the provincial infrastructure for crude oil collection and production is aging. The oil infrastructure needs to be maintained in anticipation of increased usage from the application of new technology. The industry needs to achieve an appropriate level of financial strength and/or be incented to make these additional investments;

- *Decreased development of technology and innovation.* Technological innovation requires industry activity. The ability to enhance conventional gas and oil recovery and access unconventional gas requires innovative technology. Without the industry activity and associated investment capital, Alberta will not develop the technology it requires to be competitive;
- Lower government revenues (royalties, taxes, land sales/bonuses). As companies invest in other jurisdictions and reductions in cash flow impact re-investment in Alberta, government revenues will be negatively impacted;
- Lost jobs and lower GDP. A healthy oil and gas industry provides jobs both directly and indirectly. Alberta's service sector including drilling, service rig, supply and manufacturing companies are major employers of Albertans. As industry activity declines, Alberta will be impacted by lost jobs and a reduction in the spin-off activity associated with the industry;
- *Migration of intellectual capital.* While the oil and gas industry is capital intensive, it also requires significant intellectual capital. Alberta currently holds a position of competitive advantage for this factor, but as industry activity and investment declines the province risks losing this strength; and
- *Reduced activity and development of value added sectors.* Alberta is striving to encourage the development of value added sectors. The oil and gas industry both directly and indirectly contributes to this.

The fact remains that Alberta has significant hydrocarbon resources. Geological assessment shows that Alberta possesses 87 trillion cubic feet (Tcf) of recoverable, conventional natural gas deposits exist in Alberta, and large amounts of shale gas⁴¹. Though the Western Canada Sedimentary Basin (WCSB) is considered relatively mature, there are substantial amounts of conventional oil that can be extracted if innovative recovery techniques are employed⁴². Alberta also has strengths that can be leveraged to attract investment capital if changes are made. The following section presents a set of recommendations for government consideration on how Alberta can bridge the gap between its current competitiveness position and the vision of where it wants to be.

⁴¹ Source: http://www.energy.alberta.ca/OurBusiness/Gas.asp

⁴² Source: http://www.energy.alberta.ca/OurBusiness/Gas.asp

11. RECOMMENDATIONS

Over the course of the technical analysis and stakeholder consultation, the project committee developed principles to guide the Department of Energy in planning for improved competitiveness. The principles envision continued investment in a sustainable and vibrant industry in Alberta because of the excellent opportunities and effective public policy.

Partnership

- Alberta's resources are developed in a spirit of mutual trust, respect, and cooperation among industry, government and its citizens.

Equal Opportunity

- Alberta's resources are developed through open, transparent, and competitive markets.

Predictability

- Alberta's regulatory and fiscal policies promote confidence, predictability and stability.

Environment and Conservation

- Alberta's resources are developed in a manner that is consistent with good conservation practices and respect for the environment.

Knowledge and Innovation

- Alberta's resources are developed through practices that promote the advancement of technology;
- Alberta's resources are developed through practices that are based on a broad understanding of the opportunities and challenges faced by Alberta's oil and natural gas industry; and
- Sustainable and vibrant industry activity enables Alberta to be at the forefront of knowledge and innovation advances in the sector.

Using these principles to guide future action, the following are desired outcomes for Alberta's investment competitiveness.

- Alberta is a vibrant and attractive place to live, work and invest with outstanding opportunities for current and future generations;
- Alberta's fiscal and regulatory structure helps enable the natural gas and oil sector to be competitive successful and sustainable, delivering maximum value to Albertans;
- Alberta is a leader in energy development, technology and innovation;
- Alberta's resource management framework reflects trusting and lasting relationships among all stakeholders; and
- Alberta is recognized as the preeminent choice for oil and gas investment in North America.

Fiscal Regime

The financial terms of Alberta's system of resource development need to strike a balance between the risks that investors and entrepreneurs take in developing the resource and the rights of the citizens of Alberta who are the resource owners. The analysis of the current situation indicates that the correct balance has not been found for appropriate sharing in the current competitive environment. Investment capital is highly mobile and will move to the opportunities that better meet the investors' decision criteria.

Alberta must create the right environment for investment by ensuring that its fiscal system is based on a sound understanding of the oil and gas business and what it takes to convince investors to put their money into Alberta. In essence, the fiscal system design must create a sense of confidence that Alberta is not only a good place to invest based on the numbers, but also based on the business relationship.

The following are recommendations for the DOE to improve the fiscal regime keeping in mind the principles of partnership and equal opportunity.

Recommendation 1:

Modify Alberta's royalty framework to address competitiveness and ensure industry activity in Alberta is sustainable and vibrant.

In recognition of the competitive environment in which Alberta's oil and gas industry operates, the royalty system to be help Alberta become more competitive for investment. Alberta's current fiscal environment is not as attractive as other competing jurisdictions.

Specific analysis and changes to the royalty framework will need to be undertaken over the next few months to ensure careful implementation that will support competiveness and equal opportunity. Royalties are calculated based on four factors: time, production, depth, and commodity price. With this kind of complexity it will be important to take the necessary time to ensure that the detailed framework reflects the design criteria, stimulates investment and ensures appropriate sharing of revenue.

The following design criteria should be considered when modifying the royalty framework for natural gas and conventional oil:

- Ensure that the modifications consider the fiscal impact and align with the provincial energy strategy, economic policy and objectives;
- Re-balance the royalty curves using current price and production variables so Alberta remains competitive with other jurisdictions;
- Reduce front end royalties. This recognizes high upfront costs and returns capital to companies quicker resulting in increased investment;

Reduce royalties at higher price levels;

Develop a transition program from the current system which does not disadvantage current drilling activity; and

Enhance the simplicity of the royalty framework.

Recommendation 2:

Develop programs if necessary to support strategic initiatives focused on specific resources or technology.

The intent of a redesigned royalty framework is to incorporate as much as possible of what can be done to stimulate investment and build confidence. However, to meet its goals for developing certain technologies or to develop certain resources Alberta may need to implement programs in areas such as:

Enhanced oil recovery;

Unconventional oil;

Deep drilling; and

Shale gas.

Recommendation 3:

Continually monitor the fiscal regimes of competing North American jurisdictions to ensure that Alberta is an attractive place in which to invest and do business.

Stability and predictability depends on a deeper understanding of the broader fiscal, regulatory and business climate that we are operating in. This will ensure that Alberta maintains a competitive advantage.

Alberta's desire to be a preferred jurisdiction for investment requires that we look both internally within Government and externally to monitor the health of the industry. Monitoring the health of the industry can be achieved through indicators such as: investment, market share, employment, drilling rig counts, land bonus and royalty revenue.

Recommendation 4:

Examine the broader fiscal regime, including taxes, in partnership with Alberta Finance and Enterprise, to ensure investment competitiveness.

The oil and gas industry is affected by a variety of tax provisions in addition to royalties and a range of fees pertaining to the regulatory system. Alberta and the industry may be able to benefit from changes to the broader fiscal system if these changes are based on a common understanding of how industry works and competes. Alberta for its part must ensure alignment of the fiscal regime with its vision as outlined in provincial energy and economic policy.



Regulatory Framework

The regulatory framework was the subject of as much concern as the fiscal regime, for industry, service sector and financial stakeholders. Alberta's regulatory system is seen as needing revision to bring the requirements and process into alignment with those of competing jurisdictions. Alberta's regulatory system is a major factor influencing investment decisions.

The negative perception of the regulatory system exacerbates uncertainty and undermines investor confidence. The time required to getting approvals; the increasing burden of requirements; and the administrative cost associated with the system are deteriorating in the opinion of the industry stakeholders.

Changes to the regulatory regime need to protect Albertans while enabling the safe development of resources.

Recommendation 5:

Reduce the regulatory burden and costs by redesigning the regulatory regime to: eliminate duplicate processes; reduce unnecessary delays and costs; reduce unnecessary requirements; and ensure alignment across government to make the system more competitive.

The regulatory system is a key competitiveness factor. Stakeholders strongly believe that the system must deliver on its requirement to protect citizens and the environment and still conduct business on a predictable, timely basis. Re-designing the regulatory system is expected to reduce the burden of requirements that industry faces. Many features of the present regulatory system add significantly to the costs to industry.

Re-designing the regulatory system should consider the following design principles:

- The regulatory system should consider the risks and cost that the industry faces in development and production;
- Consolidate government accountability and coordination of regulations to reduce unnecessary redundancy and promote a culture that enables the oil and gas business in the province; and
- Balance is required to enable development while respecting good conservation and environmental practices.

By accomplishing the above objectives, managing the change process and managing the regulatory systems on a consistent basis a more unified and aligned governance of the system will emerge and make Alberta more competitive.

Recommendation 6:

Set measureable objectives for the regulatory regime (e.g., costs, timelines, and regulatory standards) and benchmark against other jurisdictions in North America to support continued competitiveness.

In order to achieve and maintain a desired level of competitiveness ambitious objectives will need to be set for transformation. Alberta will need to determine how and on what basis it will compare itself against the competing jurisdictions to ensure that we remain attractive to investors. This will require a survey not just of the standards, but also of the quality of service offered to investors.

Recommendation 7:

Improve the flexibility of the regulatory regime to address new technology and resource opportunities.

The regulatory system is not seen as enabling the development of new resources in Alberta nor does the system accommodate innovation and new technology well. The system will need to find ways to enable the development of new resources while maintaining safety.

Technology and Innovation

Developing Alberta's resources depends on technology and innovation. As industry works in the mature Western Sedimentary Basin, new technologies and innovative approaches will be essential for developing Alberta'a natural gas and conventional oil reserves, reducing costs, and improving environmental performance.

Government should make a policy statement that it is actively involved in development of technology and innovation in Alberta's oil and gas industry because innovation will support further prosperity and reduce the environmental impact of oil and gas development.

Recommendation 8:

The government must continue to leverage its innovation system in partnership with industry, the research community and other partners to pursue joint technology and innovation strategies encompassing:

The fiscal system; The regulatory system; Knowledge transfer; Educational investments; and Research funding.

Well executed investment in upstream oil and gas development technology will strengthen existing industry collaborations in technology development among DOE, Alberta Advanced Education and Technology, Alberta Innovates and Alberta's post-secondary institutions. Alberta has a robust and aligned innovation and research funding system, excellent polytechnic institutions and universities whose work can become more aligned with industry and the broader research community through jointly developed priorities and approaches.

These efforts should include:



Provisions of the royalty and tax structure to stimulate the activity needed to support innovation and to recognize additional costs.

Conventional oil and its potential in Alberta.

- Ensuring regulators are knowledgeable about new technology and open to innovation, to eliminate the barrier of regulation to innovation and technology; and
- Establishing a regulatory program to enable "pilot" projects for deploying new technology. This would enable the monitoring and control for potential risks. Once the "pilot" is complete the information gained can be used to improve the method and to adapt the regulatory system to enable technology transfer within the regulatory system and industry.

Recommendation 9:

Enhance technology development and deployment that supports industry in addressing the environmental impacts of the oil and gas sectors, and encourage the use of natural gas, a more environmentally friendly fuel source.

Innovation and technology can be used to reduce the environmental impacts of oil and gas production. Industry and government can work together on programs to provide incentives for this kind of innovation in the field as well as to transfer "greener" technology from research settings.

Business Climate

Leadership and Partnerships

Alberta is in the energy business. Albertans own most of the province's oil and natural gas resources and upstream oil and gas development is a major part of Alberta's economy. This key message should resonate throughout Alberta. Not all Albertans may not be aware of the importance of industry to the province's overall prosperity and of the excellent record Alberta has in the safe development of energy sources. The leadership and partnerships concept will enable Albertans to participate in the industry where, as resource owners, they have a significant role to play. Inside government this means shifting the strategy from administrative oversight to facilitate responsible development of the resources.

Industry stakeholders place a high value on the nature of business climate in the jurisdiction that they operate. Perceptions that a jurisdiction is not supportive of the industry, over regulates, and is unpredictable in the development of policy, negatively affects decisions about investing in Alberta.

Recommendation 10:

As a major partner in the energy business government (coordinated by DOE) should demonstrate stronger leadership in facilitating the responsible development of upstream oil and gas. by:

Ensuring connection and alignment within government's policy and strategy;

Advocating on behalf of industry with other governments; Removing obstacles to achieve strategic goals; Influencing demand and seeking new markets; Promoting the understanding of environmental impacts; and Encouraging technology development.

Recommendation 11:

Establish regular interactions between the government and industry to share information, ideas and discuss issues that support responsible and proactive resource development. Ideas for interactions include:

Joint advisory committees of oil and gas executives and members of the financial sector;

Cross sector secondments; and

Information and education sessions on industry issues (e.g. Shale Gas Symposium).

Many stakeholders inside and outside of government observed that the current business culture has arisen in part because of insufficient dialogue between industry and government. As partners in the development of the resources there are opportunities for development of cooperative approaches and resolution of issues. Active engagement with industry to ensure its success is a key to prosperity for Albertans.

Cross sector appointments can be used to enable government and industry to better understand the unique roles that each partner plays in the development, ownership and oversight of the resources.

The December 2009 Shale Gas Symposium was an event that brought together political and industry leaders to learn about and discuss the competitive challenge that has arisen form shale gas development in other jurisdictions. This session was seen a model for future opportunities to discuss matters of mutual interest.

Cross sector secondments could also be used to enable the Alberta government and industry to better understand the unique roles that each plays in the development, ownership and oversight of the resources.

Communication and Education

The people of Alberta are resource owners and benefit significantly from the development of oil and gas. A strategy to have Alberta well attuned to the nature of its role as an energy province needs to consider the public at large. A better partnership with a more balanced view of the sector can be achieved through improved communication and education with Albertans and wider audiences.



Recommendation 12:

Ensure that government better articulates and shares the vision of the Provincial Energy Strategy with Albertans, and the contribution of oil and gas to our economy, business and environment.

Public attitudes have an impact on the business environment. Communicating the vision in the *Provincial Energy Strategy* which sets out a framework for the efficient development of Alberta's resources and the creation of new opportunities to sustain Alberta's prosperity, including the development of clean energy and the use of natural gas to fuel value-added growth. Given the significance of oil and gas development to Alberta's economy, Albertans should be aware of the strategy and its vision.

Recommendation 13:

Develop a communications strategy on the importance of the oil and gas business to Albertans and government's role in promoting responsible energy development.

The oil and gas industry in Alberta is subject to a lot of attention and given its importance to the province, rightly so. Industry perceives that there is an undeserved negative perception of the business. As partners in the development of our resources government and industry can work with Albertans to clearly understand the concerns and work to address them For example, a public communications strategy which highlights the new and innovative programs that are occurring within oil and gas and the impact on Albertans.

In preparing young Albertans for life in an energy province, our schools may be able to provide more information on the science and technology of oil and gas development. This should enable students to better understand the need for resources, the impact on the economy and the environmental issues.

Recommendation 14:

Government should improve its efforts to communicate the policies and actions that Alberta is undertaking toward the development of cleaner energy sources and the potential of natural gas as a source of that clean energy.

Natural gas provides a way to reduce carbon emissions. Current and planned initiatives that Alberta is supporting can indicate our commitments to more responsible environmental practices.

12. CONCLUSION

The *Natural Gas and Conventional Oil Investment Competitiveness Study* was commissioned because the environment that Alberta's industry operates in changed, and there were signs that it was challenging to attract investment in Alberta's natural gas and conventional oil sectors. Concerns such as large new natural gas supplies, cost challenges facing both sectors, the Alberta government fiscal and regulatory policies negatively impacting investor decisions, and deterioration of the relationship between industry and government required further investigation.

To address the above concerns, significant collaboration occurred between the project committee and industry and financial sector stakeholders in two processes. Firstly, industry stakeholders participated in technical analysis undertaken to understand Alberta's competitive situation related to costs and the royalty system compared to competing jurisdictions. Secondly, industry and the financial sector senior executives participated in an extensive stakeholder consultation process that created a common understanding of the challenges industry faces and improved working relationships.

The key findings of the study are that Alberta is not as competitive as its comparator jurisdictions; and that there is a need for change. There are challenges and threats to the ongoing health and viability of the oil and gas industry in Alberta. The project committee believes that the government should take steps to meet these challenges. By acting on the proposed recommendations the government will ensure the continued prosperity of the industry and Albertans and see the province's competitive advantage regained. Next steps should include reviewing the recommendations, developing short and long-term implementation strategies and collaborating with industry to address fundamental issues affecting competitiveness so that Alberta can be the pre-eminent jurisdiction for oil and gas investment.

