Contribution of the NADC Region to the Alberta and Canadian Economies

Submitted to	Northern Alberta Development Council
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The report concludes with a discussion of the key factors likely to affect the continued growth and development of the NADC regional economy including risks faced by the region as a whole and anticipated changes to key industries.

The most salient findings are summarized below:

Population

- The NADC is currently home to 346,000 people, approximately 9.5% of Alberta's total population.
- Approximately 10% of the region's population lives on Métis Settlements or First Nations Reserves. A further 13% of the off-reserve population identify as being of Aboriginal heritage.
- In addition to the permanent population in the region there were an estimated 55,000 mobile workers in the region in 2011, primarily in the Rural Municipality of Wood Buffalo.

Labour Force

- In the past decade, the region's labour force has demonstrated an unemployment rate generally in line with the provincial average and a labour force participation rate well above the provincial average.
- The region's labour force is very focused on resource extraction. The proportion of the labour force engaged in the mining, oil, and gas sector and the forestry sector is nearly double the provincial average.
- Of the estimated 55,000 mobile workers in the region, approximately 50% live elsewhere in Alberta, 45% live elsewhere in Canada, and 5% live permanently outside of Canada.
- The on-reserve Aboriginal labour force in the region has extremely low labour force participation and extremely high unemployment rates.

Income

- Average individual employment income in the NADC region is estimated to be $70,000 in 2011, well above the provincial level of $54,000.

- Wages paid to mobile workers who live outside Alberta but elsewhere in Canada totaled an estimated $3 billion in 2011.

Capital Investment

- Approximately 30% of all capital investment in Alberta during the 2005 to 2012 period has taken place in the NADC region.

- Of all the capital investment within the NADC region, nearly half was in the mining, oil, and gas sector – primarily in oil sands projects. This is well above the provincial level of 15%.

Gross Domestic Product

- The NADC regional economy is estimated to have produced approximately 17% ($41 billion) of Alberta's total GDP in 2011. The region's contribution to provincial GDP has varied between 17% and 19% during the 2001 to 2011 period.

- Of the GDP produced within the region, slightly more than half can be attributed to the mining, oil, and gas sector.

- Although relatively small in absolute dollar terms, the region is also home to prominent forestry and agriculture sectors, accounting for approximately 80% and 20% of total provincial output respectively.

Regional Economic Health

- The NADC regional economy is highly focused on resource extraction - primarily oil sands development and to a lesser degree agriculture and forestry. This lack of diversification makes the economy overly susceptible to market and political changes that affect the pace of development in the oil sands.

- During the recession of 2008 and 2009, the volatile nature of the undiversified economy was evident as capital investment in the NADC dropped by an estimated 65% but had nearly returned to pre-recession levels by 2010.

Trade

- In 2008, the NADC region is estimated to have:

    - produced approximately one quarter, or $13 billion, of the goods and services exported by Alberta to the rest of Canada; and

    - purchased roughly one tenth, or $6 billion, of the goods and services imported into Alberta from the rest of Canada.

- The procurement patterns of oil sands developers play a large role in the region's trade patterns. On average:

    - For every dollar of capital expenditure spent on building a new oil sands mine, $0.45 is spent on goods and services in Alberta, $0.20 in other Canadian provinces, and $0.35 accrues to foreign suppliers.

    - For every dollar of capital expenditure spent on building a new oil sands in-situ project, $0.70 is spent on goods and services in Alberta, $0.20 in other Canadian provinces, and $0.10 accrues to foreign suppliers.

Revenues to Government

- The people and firms within the NADC region contribute to government revenues primarily via income taxes and royalties paid on resource extraction.

    - Personal income taxes paid by individual working in the NADC region in 2011 totaled an estimated $2.82 billion; $820 million to the provincial government of Alberta and $2 billion to the federal government.

        - The mobile workers in the NADC region paid an estimated $862 million in federal and provincial income taxes in their home jurisdictions.

    - Corporate Income taxes from the NADC regioni n 2011 totaled approximately $611 million provincially and $922 federally.

- Royalties on oil sands, conventional oil, and natural gas production within the NADC region is estimated to have been $5 billion in the 2011-12 provincial government fiscal year.

- Taxes and royalties from within the NADC region currently accounts for approximately 17% of the total revenue collected by the provincial government. This figure is expected to rise to 30% by the 2014-15 fiscal year.

Key Factors Influencing Growth

- The price of WTI on international markets, the discount from WTI to diluted bitumen, and the Canadian/U.S dollar exchange rate will impact the rate of development in the oil sands.

- Popular attitudes and official government policy towards the consumption of oil from the oil sands have the ability to alter international demand for Alberta bitumen.

- The ability of oil sands producers to deliver their product to foreign markets may be constrained by pipeline capacity and limitations of other physical infrastructure, thus slowing the pace of development in the oil sands.

- Natural events such as the mountain pine beetle infestation and outbreaks of BSE in cattle can significantly impact growth in the forestry and agriculture sectors respectively.

Future Opportunities

The following opportunities exist for the Alberta and NADC regional economy to grow and increase the percentage of the economic benefits captured local. They are:

- increasing the upgrading and refining capacity within Alberta will allow for more value-added in the province and possibly the NADC region which will create additional jobs and revenues to government;

- training, educating, and offering other needed supports to the under-engaged and under-employed Aboriginal workforce throughout the region;

- encouraging the expansion of the support industries related to oil sands construction and operations such as the ability to fabricate key components;

- diversifying the output of the forestry industry to include new products such as wood-based biofuels and engineered structural products.

1. Introduction

The Northern Alberta Development Council (NADC) is responsible for encouraging economic growth and community development in northern Alberta. As such, the NADC is interested in the overall structure and health of the regional economy, as well as the region's economic contribution to the rest of Alberta and Canada.

This report presents a profile of the NADC region's geography, population, and economy as well as an assessment of the overall economic health of the region. Following the regional profile is a discussion of the pathways through which the NADC regional economy is linked to the rest of Alberta and Canada as well as estimates of the contributions of the region to job creation, capital investment, gross domestic product, interprovincial trade, and government revenues at a provincial and national level.

The report concludes with a discussion of the key factors likely to affect the continued growth and development of the NADC regional economy going forward including risks faced by the region as a whole and anticipated changes to key industries.

2. Overview of the NADC Region

2.1 Geography

The NADC region represents 60% of Alberta's landmass and encompasses nearly all of Alberta north of Grande Cache[1] including 22 municipal districts, 27 cities and towns, 29 First Nations, and all of Alberta's eight Métis settlements. A map of the precise geographic boundaries of the NADC and a complete listing of all the communities contained within it can be found in Appendix A.

The region contains much of Alberta's natural resources within its boundaries. Specifically, 100% of the oil sands deposits, 86% of forests, roughly 30% of both conventional oil and natural gas production, and approximately 28% of Alberta's total farm area lie in the NADC region (NADC 2012, ERCB 2010, AB AG 2010, Nichols Applied Management). This abundance of natural resources has been vital to the growth and development of the NADC region and resulted in an economy that is very focused on resource extraction and production.

2.2 Population

Unlike other areas of Alberta, the NADC region accommodates a large contingent of non-permanent population related primarily to the exploratory drilling and construction phases of oil sands projects. These mobile workers are one of the mechanisms through which the economic benefits of the NADC region flow to regions elsewhere in Alberta and Canada. The discussion of population in the NADC region will therefore be divided into two sections, the permanent and the non-permanent population.

2.2.1 Permanent Population

The 2011 federal census indicates that the population within the NADC region, including Métis settlements and First Nation reserves[2], is approximately 346,000 or 9.5% of Alberta's total population. Roughly 60% of the population is found in rural municipalities, Métis Settlements, and First Nations Reserves throughout the region with the remaining 40% living in small cities and towns. This rural/urban split as well as the size of the region relative to the Province has been relatively constant over the past decade. The population of the NADC region over the past ten years can be seen in Table 2.1.

[1] Excluding the Barrhead, Westlock and Smoky Lake Regions.

[2] In addition to the Aboriginal population living on reserve and the Métis living on settlement, 13% of the people living in municipalities throughout the region identify as being of Aboriginal origin.

Table 2.1: Permanent Population in the NADC Region

Population	2001	2006	2011
	[000s]		
Cities and Towns	119.2	131.8	140.6
M.D.s and S.M.s	135.5	149.2	170.5
Métis Settlements	5.1	6.0	9.0
First Nation Reserves	15.7	17.5	26.0
Total NADC	**275.5**	**304.4**	**346.0**
Alberta	2,975.0	3,290.4	3,645.3
NADC as % of Alberta [%]	**9.3**	**9.3**	**9.5**

Statistics Canada Federal Census 2001, 2006, 2011; Aboriginal Census 2001, 2006, 2011;
Métis Settlement General Council Community Profiles; Aboriginal Canada Portal; Nichols Applied Management.

Over the ten-year period between 2001 and 2011, the permanent population of the NADC region has grown at an average annual rate of 2.26%, slightly above the Provincial average of 2.05%. It should be noted that population growth has not been uniform across the NADC region, with service centres such as Fort McMurray and Grande Prairie growing at higher average annual rates of 6.2% and 4.1% respectively (RMWB Census 2000, 2010; Statistics Canada 2001, 2011).

2.2.2 Non-Permanent Population

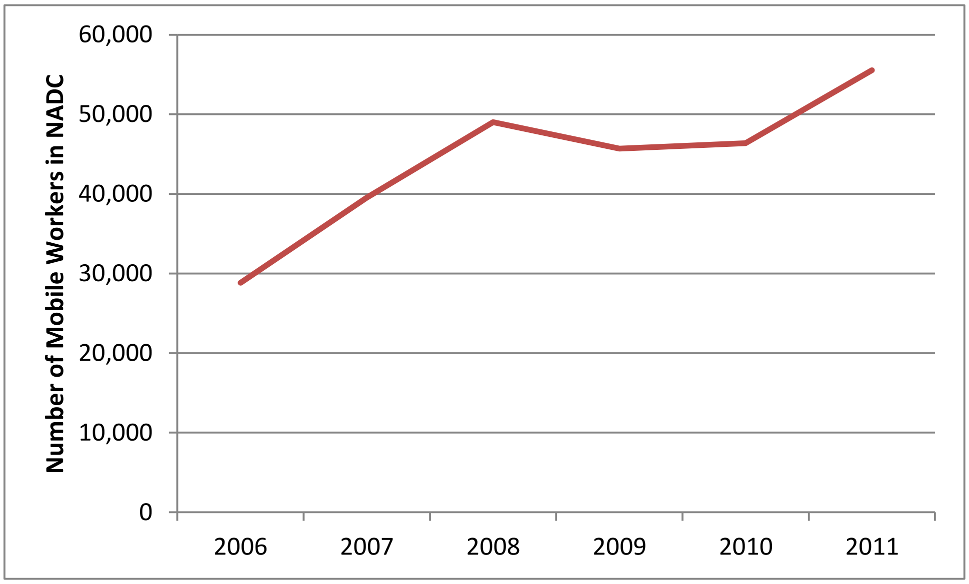
As on-site labour requirements for oil sands and other resource based projects change with the seasons and project phases, so too does the number of mobile workers temporarily in the region. For example, the number of mobile workers in the region is higher during winter months due largely to the winter drilling programs that are carried out by oil sands firms.

The dynamic nature of a mobile workforce presents a significant challenge in accurately counting the non-permanent population in the NADC region. The consultants have drawn on several sources to estimate the non-permanent population present in the NADC region in 2011. They are:

- the 2007 Shadow Population in Northern Alberta report prepared by Mary Joan Aylward for the NADC;
- the 2008 Survey of Oil Sands Mobile Workers conducted by Nichols Applied Management on behalf of the Regional Issues Working Group (now the Oil Sands Developers Group (OSDG));
- the annual OSDG Survey of Project Accommodation;
- the 2010 municipal census carried out by the RMWB; and
- the 2006 and 2011 Federal Census of Canada.

In 2011 there were approximately 55,000 mobile workers living on a non-permanent basis in the NADC region, concentrated primarily in the Fort McMurray area of the Regional Municipality of Wood Buffalo (RMWB). These mobile workers comprise a group equal to approximately 16% of the permanent population, up from 9% in 2006. An estimate of the number of mobile workers in the region between 2006 and 2011 is shown in Figure 2.1.

Figure 2.1: Mobile Workers in the NADC Region 2006 to 2011



Statistics Canada Federal Census 2006, 2011; RMWB Census; OSDG Annual Camp Survey; Nichols Applied Management.

The Survey of Mobile Workers conducted by Nichols Applied Management suggests that:

- 47% have a permanent residence elsewhere in Alberta ;
- 44% hail from outside Alberta but elsewhere in Canada;
- 5% live permanently in the NADC; and 4% live outside Canada.

The distribution of those mobile workers living outside Alberta but elsewhere in Canada can be seen in Table 2.2.

Table 2.2: Place of Permanent Residence of Mobile Workers from Elsewhere in Canada

Place of Residence	% of Mobile Workers from Rest of Canada
Newfoundland and Labrador	22
Nova Scotia	18
British Columbia	16
New Brunswick	11
Saskatchewan	11
Ontario	10
Prince Edward Island	4
Yukon	3
Manitoba	3
Quebec	2
Total	100

Nichols Applied Management

The mobile workers who are employed in the NADC region and return home to other parts of Alberta and Canada are a key pathway through which the wealth created in the NADC is transferred to other parts of the country. This concept will be elaborated upon in section 3 of the report.

2.3 Regional Economy

The local economy of the NADC region can be characterized through an examination of the following:

- the labour force working and living within the region;
- the type and magnitude of investment taking place in the region; and
- the production of goods and services.

2.3.1 Labour Force

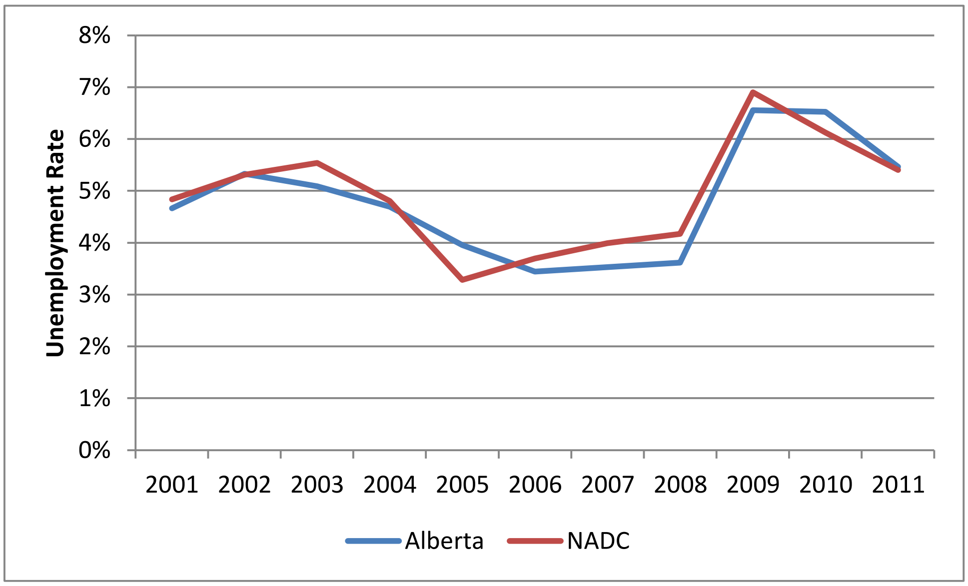
2.3.1.1 Key Employment Metrics

In early 2012, the NADC region[3] had a labour force participation rate of approximately 75% and an unemployment rate of 4.8%, slightly above and below the respective provincial averages of 73.9% and 5.0% (AB Finance MER March 2012).

[3] Annual labour force statistics are not tabulated for the NADC region specifically. The key labour force metrics presented here reflect the two economic regions in northern Alberta defined by Statistics Canada. These economic regions include all of the NADC communities plus Barrhead County, the Town of Barrhead, Thorhild County, Westlock, Clyde, Smoky Lake County, and the Town of Smoky Lake.

Over the past ten years, the unemployment rate in the NADC region has tracked the provincial average very closely, slightly above during the recession of 2008-2009 and slightly below in 2010 -2011 (Figure 2.2). It is worth noting that the non-permanent population discussed in section 2.2.2 consists almost entirely of individuals who are present within the region and gainfully employed. Since these men and women are not represented in the official statistics, it is most likely the case that the percentage of the total NADC population that is unemployed at any given time is actually below the numbers reported by Statistics Canada and shown in Figure 2.2.

Figure 2.2: The NADC Region [4]and Provincial Unemployment Rates

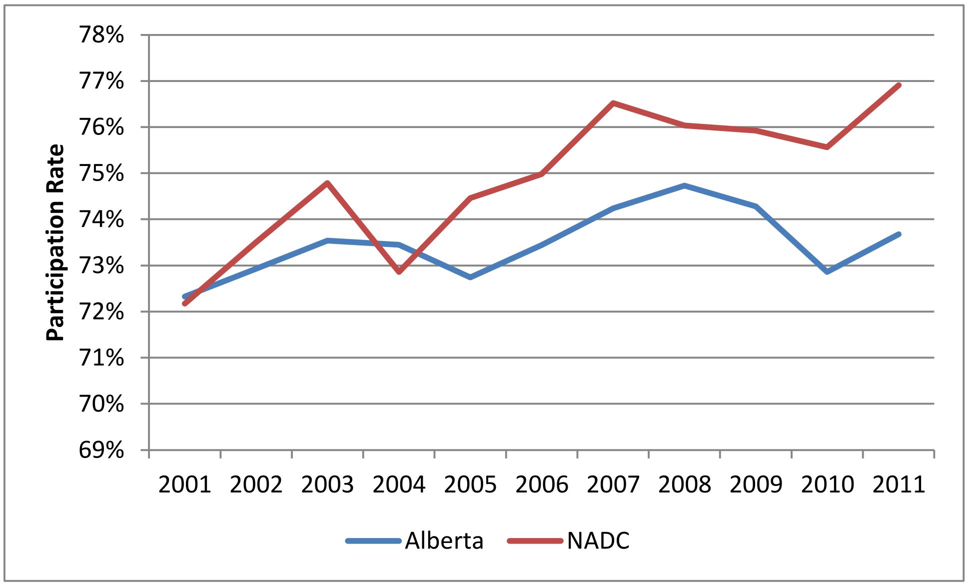


Monthly Economic Review; CANSIM 282-0055; Nichols Applied Management.

The labour force participation rate for the NADC region has been well above the provincial average for the past ten years, with the exception of 2004. As with the unemployment rate, the presence of mobile workers does confound the official measure of labour force participation. The true proportion of the total population within the NADC actively engaged in the labour force is likely above the values recorded by Statistics Canada and shown in Figure 2.3.

[4] Ibid

Figure 2.3: NADC Region[5] and Provincial Participation Rates



Monthly Economic Review; CANSIM 282-0055; Nichols Applied Management.

It should be noted that while the employment figure for the NADC region overall is favourable, the Aboriginal contingent of the labour force, estimated to be 14,000 in 2011, suffers from low participation rates and high unemployment due largely to a lack of education and training needed to take advantage of the skilled labour jobs prominent in the region (Nichols Applied Management). Labour force participation rates varied between 30% and 66% and unemployment ranged from a low of 15% to a high of nearly 32% in communities for which data was available (2006, 2011 Statistics Canada Aboriginal Census and Nichols Applied Management).

Between 2001 and 2011, the Aboriginal population grew at nearly twice the average annual rate of the regional population but remains under represented in the labour force. This trend is likely to continue unless the aforementioned barriers to Aboriginal employment are addressed.

2.3.1.2 Employment by Industry

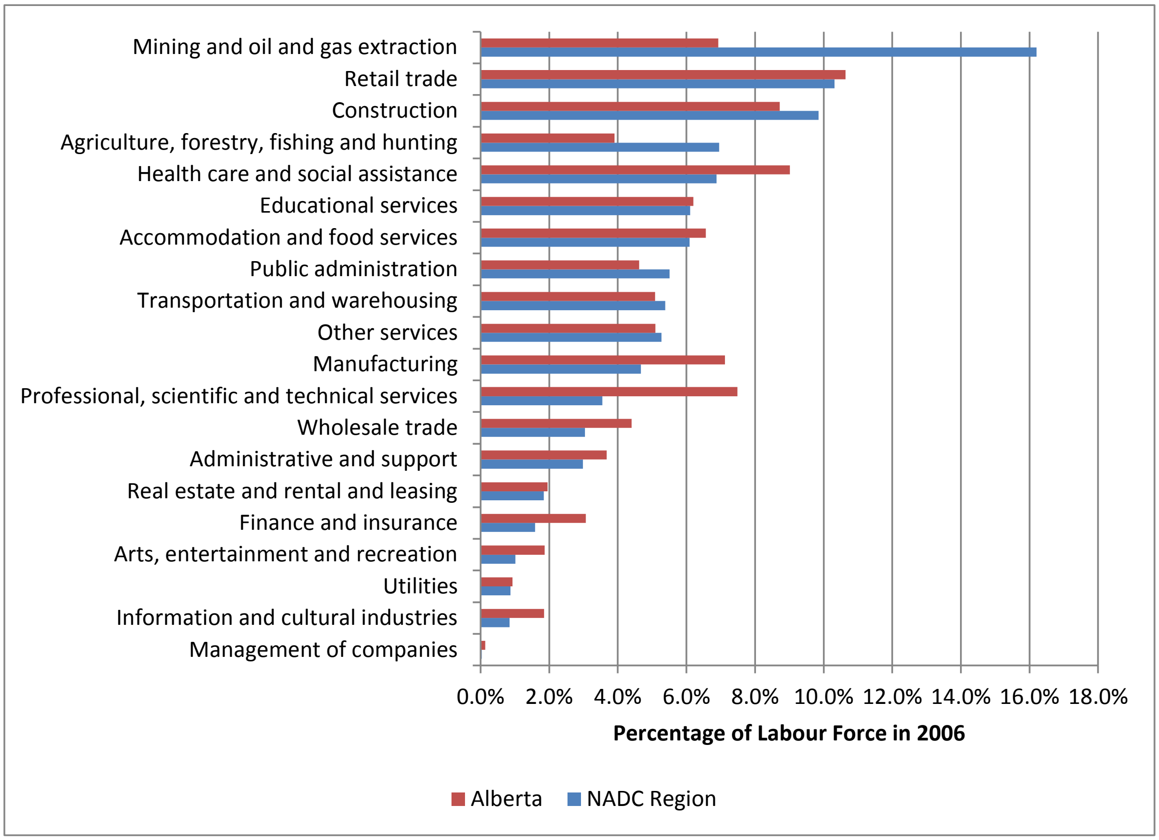
The NADC region's labour force is focused largely on primary resource extraction (Statistics Canada 2006). As shown in Figure 2.4, the proportion of the region's labour force engaged in mining and oil and gas extraction is 16%, double the provincial average of 8%. Similarly, the proportion of NADC region workers engaged in construction, an industry closely linked to the development of oil and gas resources, is nearly 10%, slightly above the provincial average of 8.5%.

Additional specialization in resource extraction is evident in the agriculture, forestry, fishing, and hunting industry with approximately 7% of the labour force engaged in such pursuits, almost

[5] Ibid

double the provincial average (Statistics Canada 2006). Conversely, the proportion of the NADC region labour force specializing in other sectors not related to primary resource extraction, such as manufacturing, finance, and professional services, is well below the provincial average.

Figure 2.4: NADC Region and Provincial Labour Force by Industry



2006 Federal Census; Nichols Applied Management.

The region's non-permanent population discussed in section 2.2.2 consists almost entirely of individuals employed in industries related to resource extraction and these individuals are not reflected in the official labour force statistics. It is most likely the case that the number of men and women employed in the mining, oil and gas, and construction industries within the NADC region is higher than Figure 2.3 suggests.

2.3.1.3 Employment Income

The total employment earnings paid to workers within the NADC region in 2011 is estimated to have been $17 billion, including:

- $3 billion paid to mobile workers from elsewhere in Alberta; and
- $2.9 billion paid to mobile workers from elsewhere in Canada (Statistics Canada, Nichols Applied Management).

The mining, oil, and gas sector that dominates the labour market in the NADC region tends to pay 30% above all other goods producing industries and as a result, the estimated average earnings of an individual in the NADC region was $70,000 in 2011, well above the provincial level of $54,000 (Statistics Canada Earnings 2011, AB Finance 2012, Nichols Applied Management).

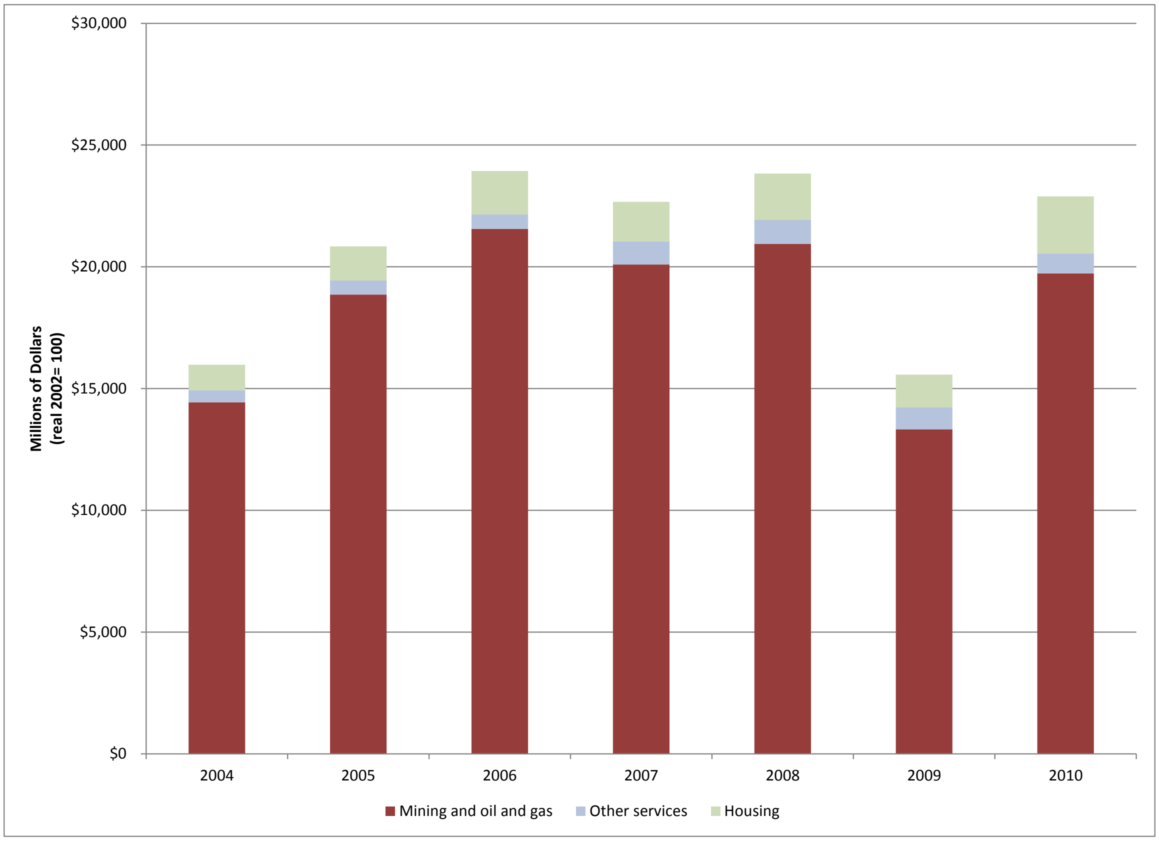
While as a whole the NADC region displays a high average income, it should be noted that not all communities within the region are equally engaged in the mining, oil and gas sector and thus incomes do vary across communities. For example, the median family income in the RMWB is nearly 77% higher than in Grande Prairie or Cold Lake (Statistics Canada Taxfiler Data 2010). It should be noted that the high wages paid within some of the NADC communities reflect a relatively high cost of living as compared to other areas of Alberta.

2.3.2 Capital Investment

The development of future productive capacity through capital investment is a necessary precondition for economic growth. By extension, an examination of the pattern of capital investment provides great insight into the likely future growth path of the economy.

Of all public and private investment in Alberta in recent years, roughly 30% took place in the NADC region (Statistics Canada Public and Private Investment 2005-2012; ERCB; Alberta Energy). The pattern of investment in the NADC region reveals, as did an examination of the labour force, an economy that is highly focused on resource extraction. During the 2004 to 2010 period, an average of 88% of all investment taking place in the region was focused in the mining and oil and gas sector, driven almost exclusively by investment in the oil sands (Statistics Canada Public and Private Investment 2005-2012; CAPP; PSAC; Alberta Energy). A further 8% of the investment in the region is made in housing, leaving approximately 4% of all investment dollars to be distributed across the remaining sectors of the economy. This trend can be seen graphically in Figure 2.5.

Figure 2.5: Public and Private Investment in the NADC Region (2004 to 2010)

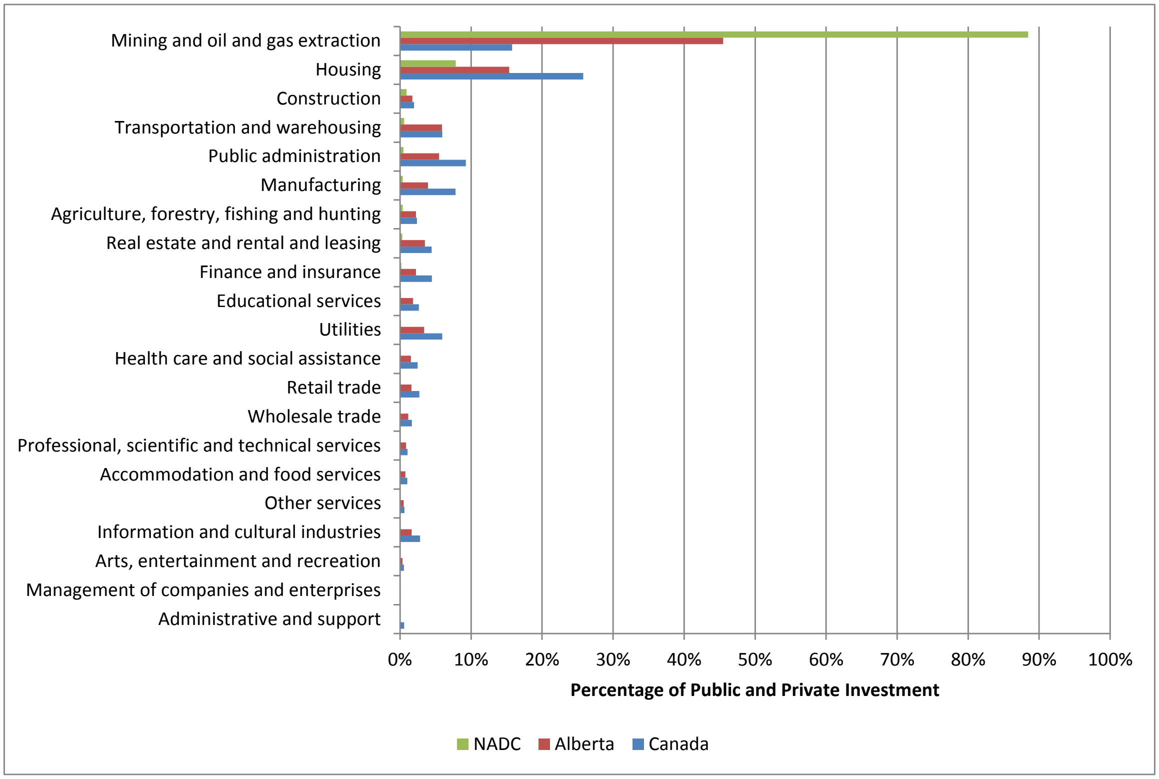


Public and Private Investment in Canada; Nichols Applied Management.

It is worth noting the highly volatile nature of investment year-to-year in the NADC region. While there is an upward trend between 2004 and 2010, there are considerable fluctuations during that period.

The highly specialized nature of the regional economy is also evident when investment across industries is compared to the provincial and national economies. Investment in the mining and oil and gas industry represent 46% and 15% of the provincial and national levels respectively. Figure 2.6 illustrates investment in the resource-centric NADC region economy relative to the more diversified provincial and national economies.

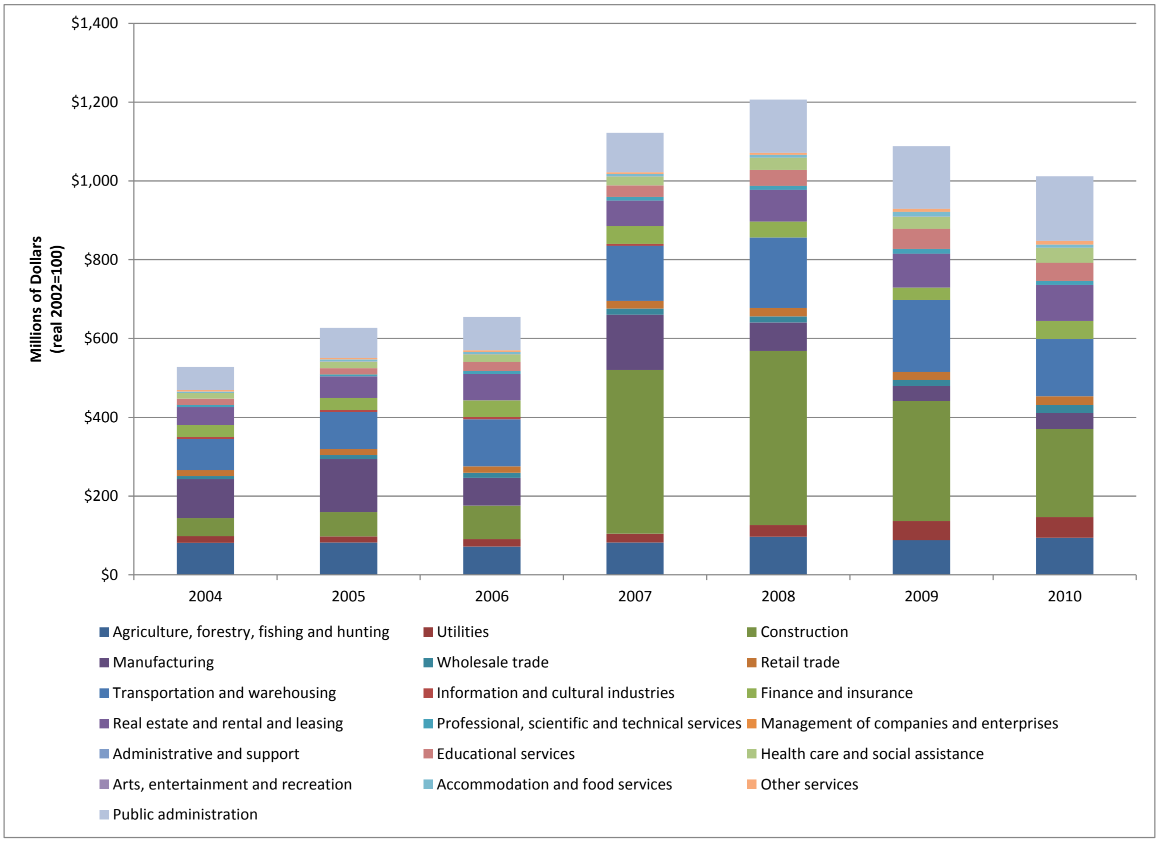
Figure 2.6: Average Percentage of Investment, by Industry, in the NADC Region, Alberta, and Canada between 2004 and 2010



Public and Private Investment in Canada; Nichols Applied Management.

Although the housing and mining, oil and gas sectors account for the vast majority of investment in the NADC region, firms in other industries are also actively investing. Public and private investment by industry in the absence of the housing and mining, oil, and gas sector can be seen in Figure 2.7. Investment in agriculture and forestry has been relatively stable between 2004 and 2010 whereas spending in the construction, transportation, and public administration sectors has increased considerably over the same time period, likely driven by expansion in the oil sands.

Figure 2.7: Public and Private Investment, without Housing, Mining, Oil and Gas in the NADC Region 2004 to 2010



Public and Private Investment in Canada, Nichols Applied Management.

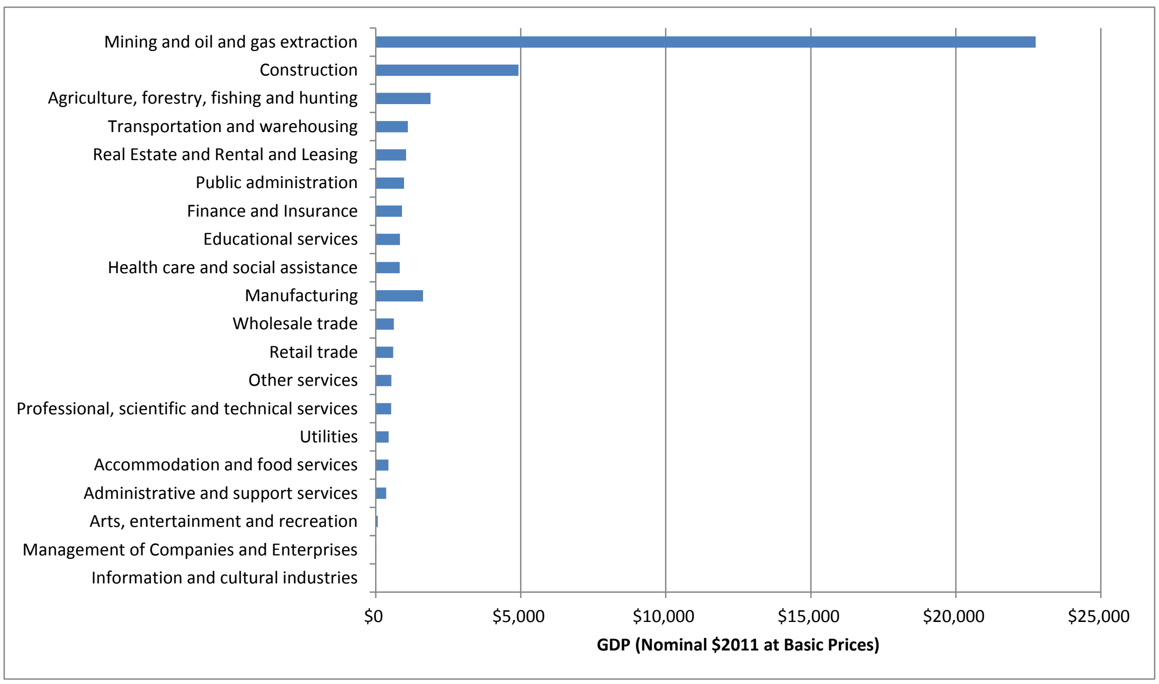
Capital investment is the foundation upon which future economic growth is built, particularly when it is occurring in industries such as the oil sands where projects are expected to operate for several decades. The pattern of investment seen in the NADC region over recent years is strong evidence to suggest that the region will continue to be highly focused on oil and gas extraction for many years to come.

2.3.3 Gross Domestic Product

Gross Domestic Product (GDP) refers to the value of the goods and services produced within a specified geographic area in a given time period. Estimating the NADC region's contribution to GDP is challenging as data are not available at a sub-provincial level. Nichols Applied Management has estimated[6] that the total GDP ($2011 at basic prices[7]) produced within the NADC region was approximately $41 billion in 2011, roughly 17% of Alberta's total $241 billion GDP (Statistics Canada 2011, Nichols Applied Management). The proportion of provincial GDP attributable to the NADC region has been relatively constant between 2001 and 2011, ranging between 17% and 19%[8].

Of the $41 billion produced in the NADC region, roughly 56% can be attributed to the mining and oil and gas sector (Statistics Canada 2011, Nichols Applied Management). Other key industries include construction as well as agriculture, forestry, fishing and hunting. The proportion of GDP generated by the information and cultural industries as well as the management of companies and enterprises is well below the provincial level (Statistics Canada 2011, Nichols Applied Management).

Figure 2.8: 2011 GDP by Industry Within the NADC Region



Cansim Table 379-0025; Nichols Applied Management.

6 Estimates based on a series of proxies consisting of oil sands specific knowledge and detailed manufacturing, investment, and labour force statistics.

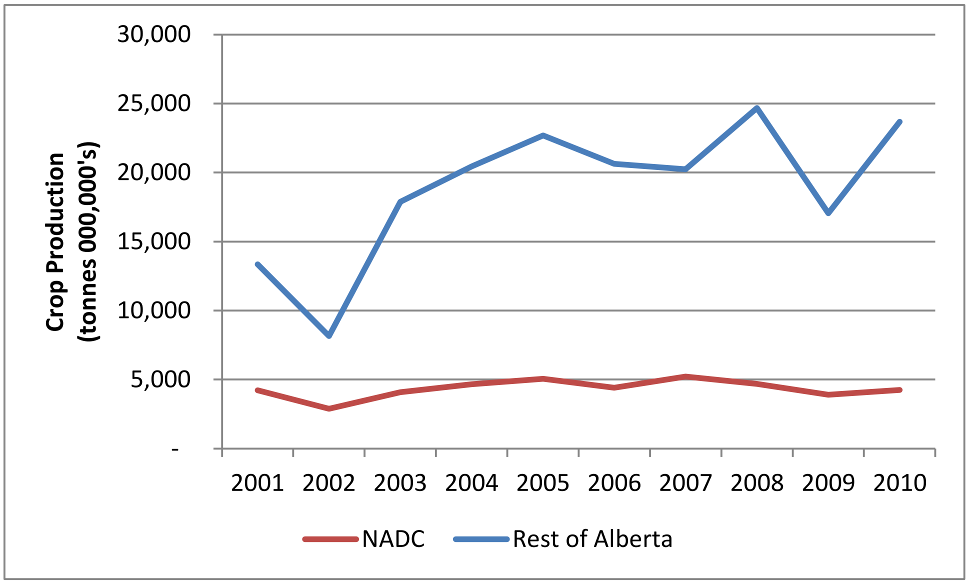
7 Basic prices include indirect taxes such as taxes levied on property, capital, and payroll less any subsidies attached to factors of production. This measure does not include direct taxes such as sales tax, duties, fuel tax or any related subsidies.

8 Measurement error resulting from data suppression by Statistics Canada precludes a clear trend from being identified.

Although in absolute dollar terms, agricultural and forestry output in the NADC region is dwarfed by the oil sands, the contribution of this sector is substantial relative to the production levels within the province.

Crop production[9] (as measured in total tonnes) in the NADC was relatively stable during the 2001 to 2010 period although the region's share of total provincial output has declined from a high of 35% in 2002 to a low of 18% in 2010 (AB AG 2010). This decrease is not due to a drop in output from the NADC region, rather an increase in output from the province as a whole, thus reducing the region's relative contribution. This trend can be seen in Figure 2.9.

Figure 2.9: Crop Output in the NADC Region and Alberta, 2001 to 2010



Alberta Agriculture; Nichols Applied Management.

Similarly, livestock farming is also a prominent sub-sector in the region with beef, bison, and elk production accounting for 22%, 71% and 58% of total provincial output respectively (Census of AG 2006).

With respect to forestry, data for the five year period between 2005 and 2009 (the latest period for which data are available) indicates that forestry operations within the NADC region have, on average, accounted for[10]:

- 69% of panelboard production;
- 93% of pulp and paper production; and
- 68% of sawmill production.

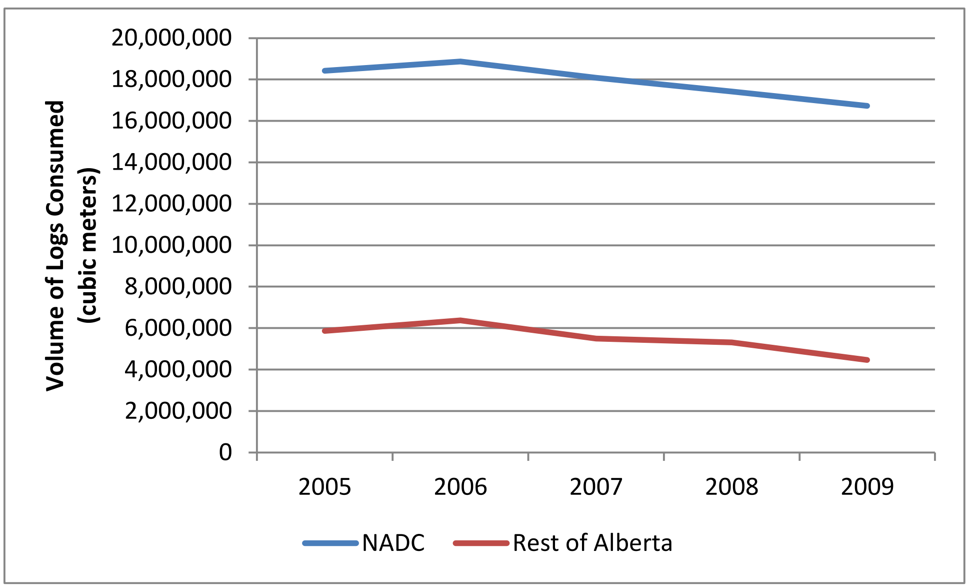
9 Includes all wheat, barley, oats, canola and tame hay.
10 As measured by volume of logs consumed.

The industry overall has contracted between 2005 and 2009. During that period, the total throughput by firms in the province dropped 13%, with the NADC region faring slightly better but still contracting by 9% (GoA 2009). Specifically,

- the production of Panelboard dropped by 45% in the NADC and 33% in the province;
- pulp and paper production was virtually unchanged in the NADC but declined by almost 50% in the rest of the province; and
- sawmill throughput was down roughly 9% in the NADC and 19% in the rest of the province (GoA 2009).

During the contraction of the forestry industry, the NADC has slightly increased its share of total forestry production in Alberta from 76% in 2005 to 79% in 2009 (GoA 2009).

Figure 2.10: Volume of Logs Consumed in the NADC Region and Alberta, 2005 to 2009



Government of Alberta; Nichols Applied Management.

2.3.4 Identification of Key Industries

Key industries within the NADC economy were identified based on their relative contribution to:

- employment;
- gross domestic product; and
- investment patterns.

Oil Sands

An examination of the labour force, output, and investment patterns across industries indicates that the NADC regional economy is driven largely by the development of the oil sands, conventional oil, and natural gas resources. Within the NADC region, conventional oil and gas and the oil sands account for approximately:

- 16% to 20% of the direct employment;
- 87% of investment;
- and 56% of GDP produced in the region.

Of the three extractive industries, the oil sands is the largest contributor to employment, investment, and GDP in the NADC region due primarily to the fact that roughly 30% of conventional oil and gas production occurs in the region as compared to 100% of oil sands production. Also, rate of growth and the scale of oil sands projects overwhelm that of conventional oil and gas in the region.

The other sectors within the region are driven, in part, by the spending of the above average wages paid to oil sands workers. The existing levels of employment, investment, and production are largely contingent upon continued operation and expansion of the oil sands. Also, the royalties and income taxes paid by oil sands operators contribute significantly to the ability of the provincial government to deliver services to all Albertans. Changes in the rate of growth or the fundamental structure of the oil sands industry will significantly impact the NADC regional economy.

Agriculture and Forestry

Although the employment levels, output, and investment of the agriculture and forestry sectors are relatively small when compared to the oil sands, the NADC region is home to a significant portion of the agriculture and forestry operators in the province. Furthermore, much of the employment in the warehousing and transportation sectors is related to the storage and movement of agriculture and forestry products out of the area.

Tourism

The NADC region also supports a tourism industry focused largely on outdoor recreation activities such as hunting, fishing, hiking, and birding (NDMF 2008). An estimated 1.5 million people visited the NADC in 2004[11] and contributed approximately $315 million to the regional economy (NDMF 2008). This spending contributes, in part, to the continued employment of individuals in the accommodation and recreation industries as well as cottage industries such as local guiding.

In addition to recreational visitors to the area, mobile workers play a large role in supporting the hotel and motel industry as many oil sands projects block-book accommodation facilities as a means of temporarily housing their work crews.

2.4 Health of the Regional Economy

2.4.1 Criteria

There are a number of factors to consider when assessing the overall health of an economy. Generally speaking, a healthy economy will demonstrate:

- ***Sustained and stable positive growth:*** Sustained positive growth in real (inflation adjusted) terms is an intuitively appealing criteria as the real growth of an economy necessarily implies wealth creation. While the appropriate distribution of this wealth across the population is an oft-debated topic, the sustained creation of wealth is necessary (but not sufficient) condition of a healthy economy. It is worth noting that rapid growth may lead to unanticipated changes in relative prices, which can place pressure on firms and individuals alike as wages and prices adjust.

- ***Full or near full employment of resources:*** Resources being at, or near, fully employed is generally considered to be a reasonable indicator of a healthy economy as no productive resources are sitting idle when they could otherwise be producing additional wealth. Idle resources necessarily imply that the current level of output, and by extension growth, could be sustained at a higher level.

- ***Diversity in the allocation of resources across sectors:*** Diversity in the allocation of resources across sectors is a criteria used to assess the risk to the future stability of an economy. An economy with a disproportionately large amount of labour or capital employed in a single industry is more susceptible to shocks, such as price or policy changes, occurring in that particular industry than an economy with workers and capital spread more evenly across industries.

[11] Latest data available.

2.4.2 Assessment of the Health of the Regional Economy

The NADC regional economy can generally be characterized as:

- having a high labour force participation and employment rate – so much so that labour is consistently imported from elsewhere in the province and country;
- having levels of capital investment well above many other areas of Alberta and Canada;
- having strong trade relationships with the rest of Canada, particularly in the export of fossil fuel related products and the import of labour and heavy equipment;
- being extremely focused on resource extraction, namely the oil sands, agriculture and forestry;
- subject to more volatility than a more diversified economy; and
- being subject to policy and market forces that act on a global, not local, scale.

The health of the regional economy of the NADC is summarized in Table 2.3.

Table 2.3: Economic Health Indicators

Criteria	Indicators	Assessment
Sustained and Stable Positive Growth	• Investment[12]	Levels of investment within the NADC region are considerably higher than in many parts of Alberta and Canada, and have grown over time (Figure 2.5). However, investment fluctuates significantly year-to-year and thus does not meet the criteria of stability.
Full Employment of Resources	• Labour Force Participation Rate • Unemployment Rate • Presence of Mobile Workers	The high participation and low unemployment rates observed in the NADC region taken in conjunction with the presence of mobile workers provide strong evidence to suggest that the labour force within the NADC is at or very near full employment. Extremely low labour force participation and high unemployment amongst the Aboriginal contingent of the regional population indicates that there is considerable disparity between those who have the skills and training necessary to engage in the local economy and those who don't.
Well Diversified Economy	• Labour Force Composition • Investment Patterns • Composition of GDP	Resource based industries, particularly the oil sands, account for a disproportionately high percentage of the labour market (Figure 2.4), public and private investment (Figure 2.5, 2.6), and GDP (Figure 2.8) within the NADC relative to the Alberta as a whole. The NADC regional economy is not well diversified. Shocks to any of the resource industries such as: • a drop in commodity prices; • a shift in public attitudes towards the consumption of oil sands bitumen; • bovine spongiform encephalopathy (BSE); • mountain pine beetle infestations; or • a change in the economic health of a major trading partner; may exert a disproportionately large pressure on the NADC regional economy. For example, a slowdown in the oil sands during the recession of 2008 and 2009 resulted in a 65% drop in investment within the NADC as compared to a 24% drop in Alberta overall (Statistics Canada Public and Private Investment).

[12] Measurement error resulting from data suppression in regional GDP estimates precludes its use as an indicator over time.

The Recession of 2008-2009

The NADC region fared relatively well during the recession of 2008-2009. Despite slowing during that period, the NADC regional economy remained a comparatively desirable economic environment as is evidenced by the continuous presence of mobile workers in the region. Individuals made the decision to travel to the NADC region to work as opposed to remaining in their home communities to weather the recession.

While unemployment continues to be marginally higher than pre-recession levels in the NADC, it is below the provincial average and labour force participation rates continue to be well above the provincial average.

The volatile nature of undiversified economies was evident during the recession as capital investment in the NADC dropped by nearly 65% between 2008 and 2009 yet nearly fully recovered to pre-recession levels by 2010.

Summary

While the NADC regional economy displays some characteristics of a healthy economy, namely the full employment of resources and positive growth, it lacks a diversified industrial base which in turn contributes to a high degree of volatility in that growth.

3. Contributions of the NADC Region to the Alberta and Canadian Economy

The economic activity within the NADC region results in a number of benefits flowing out of the region to the Alberta and Canadian economy. They are:

- the employment of people who reside outside the region and the wages paid to them;
- trade resulting in the demand for goods from elsewhere in the country and the availability of goods to those who wish to purchase them;
- revenues to various levels of government outside the NADC region as a result of the aforementioned employment income, as well as corporate income taxes and royalties paid on resource extraction.

3.1 Employment Income

Conservative estimates suggest that the NADC regional economy currently employs an estimated 236,000 individuals (Statistics Canada, Nichols Applied Management). As mentioned in section 2.2.2, an estimated 55,000 of these workers live permanently outside the region with roughly half from elsewhere in Alberta and the balance coming from elsewhere in Canada – primarily from the maritime provinces. These mobile workers are a direct linkage from the NADC economy to the rest of Alberta and Canada as wages paid to these workers are taxed and spent primarily in the communities where these individuals hail from, thus contributing to local government revenue, economic growth, and induced job creation outside of the NADC. The annual wages paid to mobile workers residing outside the NADC region total roughly $5.97 billion per year - $3.0 billion to workers resident in Alberta and $2.9 billion to those workers living permanently in the rest of Canada.

3.2 Trade

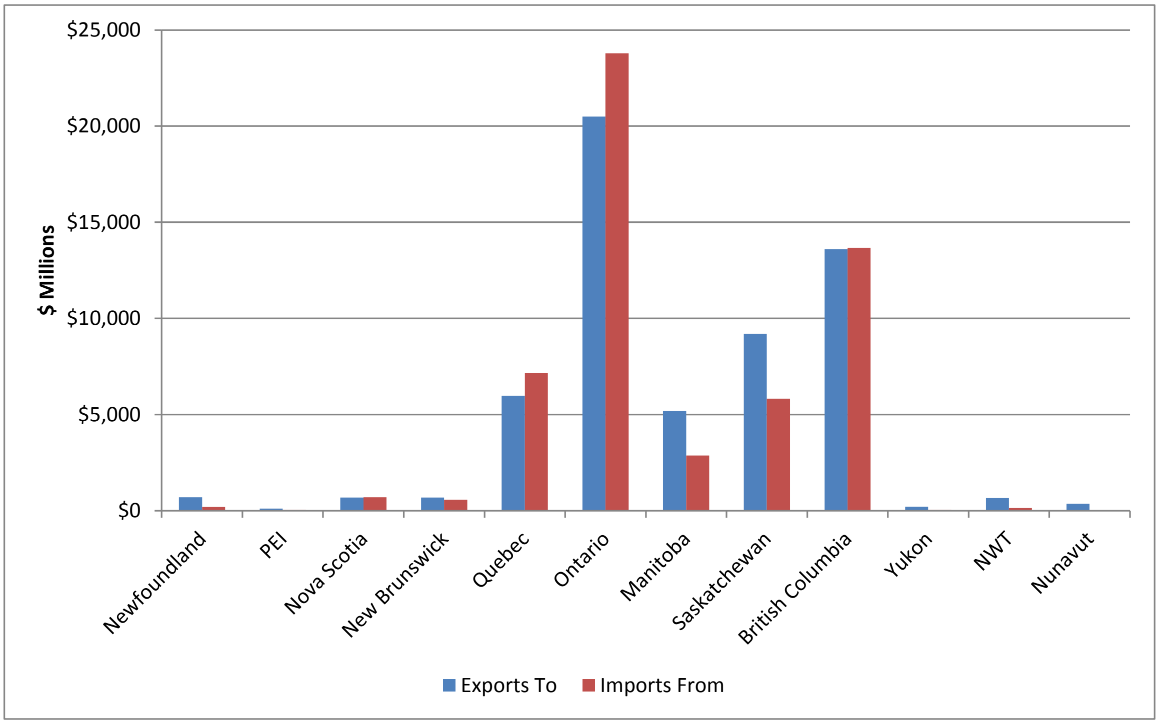
3.2.1 Alberta's Trade Relationships

Alberta plays a large role in interprovincial trade within Canada as it is the third largest exporter and fourth largest importer of goods and services of all provinces and territories (Statistics Canada Trade). In 2008, Alberta:

- purchased approximately $55 billion worth of goods and services from the rest of Canada, 20% of which was financial and professional services; and
- exported nearly $58 billion to the other provinces and territories, 40% of which was fossil fuels.

Alberta's largest interprovincial trading partner is Ontario. Approximately one third of Alberta's interprovincial exports are purchased by people and firms in Ontario and nearly half of Alberta's imports originate in Ontario. British Columbia accounts for nearly one quarter of both interprovincial exports from and imports to Alberta with Quebec and Saskatchewan also playing significant roles. Figure 3.1 illustrates the proportion of Alberta's exports and imports to and from the rest of Canada.

Figure 3.1: Alberta's Interprovincial Exports and Imports in 2008



Statistics Canada Cansim Table 386-0002; Nichols Applied Management.

Alberta also has a significant trade relationship with the United States. The U.S. purchases, on average, 85% of Alberta's total international exports, which in 2008 totalled $111 billion (AB IIR 2012). The province is currently the largest international supplier of natural gas and crude oil to America (AB IIR 2012).

3.2.2 The NADC Region's Trade Relationships

The NADC region does not contain sufficient labour or capital to fully realize the wealth of natural resources contained within it nor can its residents consume all that it produces. As such, trade relationships with other areas of Alberta, Canada, and the rest of the world are necessary to acquire the inputs for development of the oil sands and to market the goods produced in the region. These relationships are the mechanisms through which the economic activity within the NADC region is spread throughout the rest of Alberta and Canada.

Calculating the contribution of the NADC region to Alberta's interprovincial and international trade balance is challenging as trade data is not available at sub-provincial geographic levels. Nichols Applied Management has estimated[13] that in 2008, people and firms in the NADC region:

- produced approximately one quarter, or $13 billion, of the goods and services exported by Alberta to the rest of Canada;
- purchased roughly one tenth, or $6 billion, of the goods and services imported into Alberta from the rest of Canada;
- produced approximately one third, or $40 billion, of the goods and services exported by Alberta internationally; and
- purchased roughly five per cent, or $6 billion, of the goods and services imported into Alberta from the rest of the world.

Approximately 80% of NADC region exports are comprised of goods related to fossil fuels, with approximately one third being sold to the rest of Canada and the balance being sold internationally, primarily to the United States. Heavy equipment and skilled labour related to oil and gas extraction are key components of the imports into the NADC region from the rest of Canada.

In addition to the oil and gas industry, the agriculture sector is also particularly active in trade. The farms within Alberta and the NADC sell a small proportion of their output to other Canadian jurisdictions, but the majority of their exports are sold internationally.

- Nearly 60% of the grain produced in the province is exported outside Canada (AB AG 2010); and
- Approximately one quarter of the lumber harvested in the province is exported to the rest of Canada and a further 30% is sold internationally (AB SRD 2009).

The demand for $6 billion worth of goods and services by industries and individuals within the NADC region that is met by producers elsewhere in Alberta and Canada contributes to job creation and investment in the jurisdiction of origin. Furthermore, the $13 billion in exports from the region meet the needs of other Canadians both in the form of final goods but also as key inputs into other production processes.

[13] Estimated using a series of proxies consisting of oil sands specific knowledge and detailed manufacturing, investment, and labour force statistics.

Oil Sands Trade Relationships

As the driving force behind the past and future economic growth in the NADC region, trade relationships specific to the oil sands industry are of particular importance.The Canadian Energy Research Institute (CERI) has conducted a meta-analysis of environmental impact assessments filed by oil sands firms and have estimated the proportion of project-related spending (i.e. the import of goods and services) to oil sands projects during construction and operation that accrues to Alberta, the rest of Canada, and to foreign producers. These relationships[14] are described in Tables 3.1 and 3.2.

Table 3.1: Oil Sands Mine Procurement of Goods, Services, and Labour by Jurisdiction

Project Phase	Alberta	Rest of Canada	Foreign
Construction	45%	21%	34%
Operations	61%	11%	28%

CERI; Nichols Applied Management.

Table 3.2: Oil Sands In-Situ Procurement of Goods, Services. And Labour by Jurisdiction

Project Phase	Alberta	Rest of Canada	Foreign
Construction	70%	19%	11%
Operations	81%	8%	12%

CERI; Nichols Applied Management; Totals may not add to 100% due to rounding.

While no oil sands projects procure all of their inputs locally, it is worth noting that in-situ projects spend a substantially larger portion of their construction and operations budget in Alberta and all of Canada than do mining projects. For example, during production, an in-situ project will spend 81% of its operational budget within Alberta whereas a mine will spend only 61%. A similar relationship holds during the construction phase of a project with in-situ projects procuring 70% of their inputs from Alberta whereas mines purchase only 45% of their goods and services within the province.

Strong trade relationships are also necessary for the sale of bitumen extracted from the oil sands. Alberta and the NADC region produce far more bitumen than can be upgraded, refined, and consumed locally and therefore rely on consumers elsewhere in Canada and the world to generate demand for oil sands crude. Pipeline capacity out of the region effectively limits the amount of bitumen that can be recovered and sold by firms in the NADC region. Transportation of bitumen outside of the region is absolutely necessary for the continued expansion of the oil sands.

[14] Nichols Applied Management has adjusted the labour component of the CERI jurisdictional breakdown to reflect the current labour procurement patterns of oil sands projects.

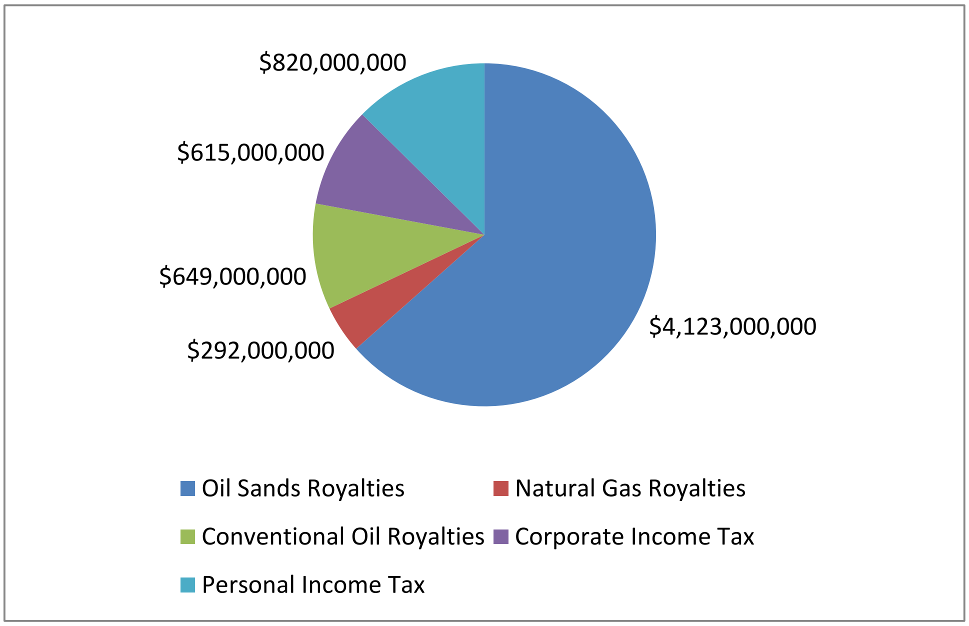
3.3 Revenues to Government

The economic activity within the NADC region directly generates primarily two types of revenue to two levels of government:

- income taxes (both personal and corporate); and
- royalties from resource extraction.

A breakdown of government revenue from the NADC region by type is provided in Figure 3.2 (ERCB 2010, AB Budget 2012).

Figure 3.2: Provincial Government Revenue from the NADC Region by Type 2011-12



ERCB 2010, AB Budget 2012; Nichols Applied Management

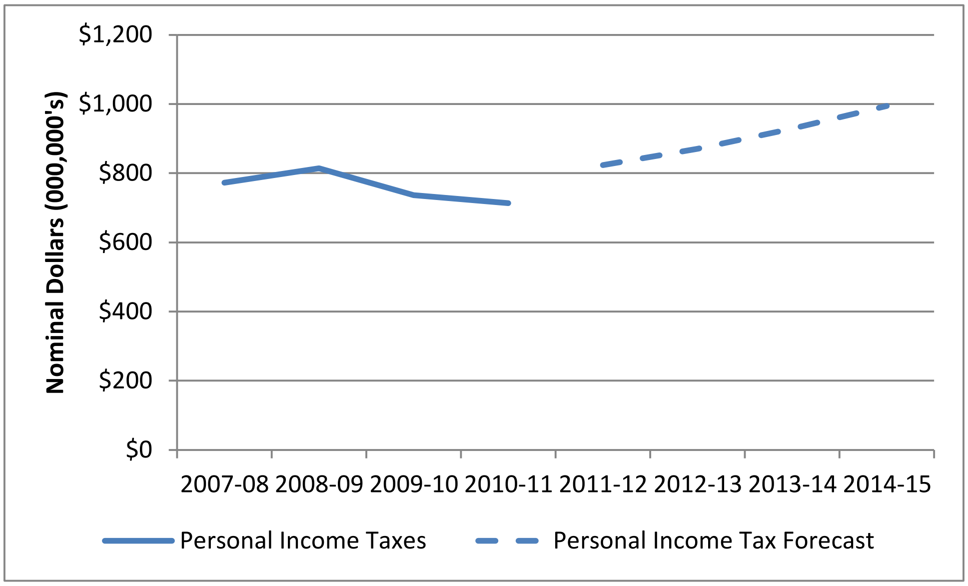
3.3.1 Personal Income Taxes

The wages paid to both resident and non-resident employees of firms operating in the NADC region as presented in section 2.3.1.3 amounted to approximately $17 billion in 2011. This income is ultimately taxed by both the federal government and the province in which the worker is resident. In 2011, tax on income related strictly to the direct employment of individuals resident in the NADC region amounted to approximately:

- $820 million in provincial tax revenue to Alberta; and
- $2 billion in federal income tax.

These figures represent roughly 10% of income tax collected provincially by Alberta and 2% of all federal income tax collected in Canada. Figure 3.3 shows the estimated personal income tax revenue collected by the province of Alberta from workers within the NADC region between 2007 and 2011 and a forecast for the 2012 to 2015 period consistent with the 2012 provincial budget.

Figure 3.3: Personal Income Taxes Collected in the NADC Region



Alberta Budget 2008 -2012; Nichols Applied Management

Income taxes paid by mobile workers in their home jurisdictions have been estimated to total an additional $862 million in 2011. The approximate distribution of income taxes paid by mobile workers in 2011 is shown in Table 3.3.

Table 3.3: Income Taxes Paid by Mobile Workers in 2011

Jurisdiction	Federal and Provincial Income Taxes Paid in 2011 ($000,000)
Newfoundland and Labrador	$193
Nova Scotia	$174
British Columbia	$129
New Brunswick	$96
Saskatchewan	$97
Ontario	$87
Prince Edward Island	$38
Yukon	$25
Manitoba	$28
Quebec	$20

Statistics Canada Table 281-0027; Nichols Applied Management.

The tax paid by mobile workers in their home jurisdiction represents income to local governments that can be used to offer services accessible to all residents of the community. In so far as the vast majority of mobile workers are employed by oil sands firms, the past and future development of the oil sands results in benefits spread throughout Alberta and Canada as a whole.

3.3.2 Corporate Income Tax

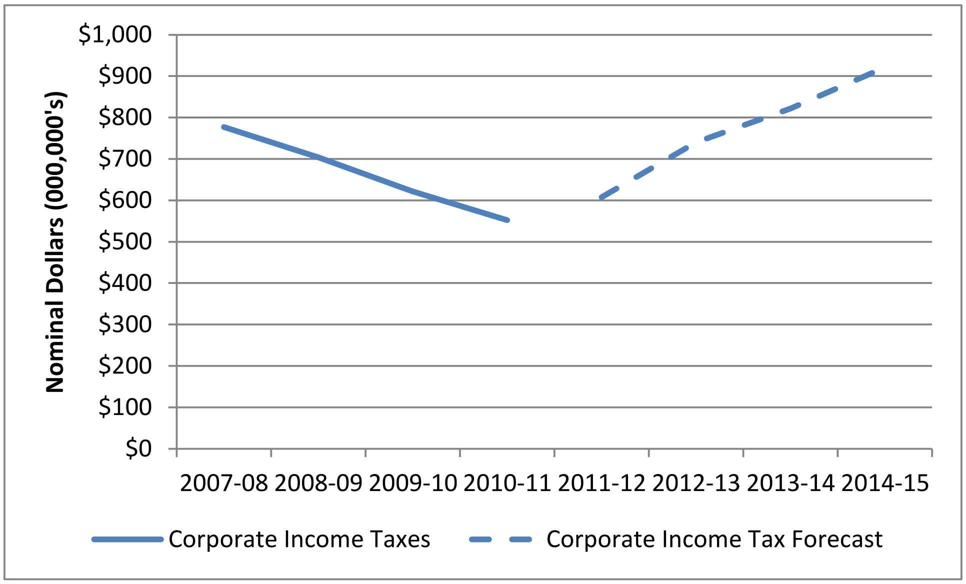
Estimating the corporate income taxes paid by firms on a regional level is problematic as corporations are not necessarily limited to operating within a single geography such as the NADC region. In many cases, the losses, profits, and tax credits accrued by a firm that is also operating in other jurisdictions will significantly impact the corporate income taxes paid by a firm with interests in the NADC region. Rudimentary estimates on the basis of GDP suggest that businesses in the NADC generate approximately:

- $611 million in provincial income tax; and
- $922 million in federal income tax.

On the basis of these estimates, the corporate income taxes collected from firms operating in the NADC region represent 17% and 2% of all corporate income taxes collected in Alberta and Canada respectively (AB Budget 2012, Nichols Applied Management). These figures do not reflect any of the aforementioned nuances with respect to cross-jurisdictional business activities.

Figure 3.4 show the estimated corporate income tax revenue collected by the province of Alberta from firms within the NADC region between 2007 and 2011 and a forecast for the 2012 to 2015 period consistent with the 2012 provincial budget.

Figure 3.4: Corporate Income Taxes Collected in the NADC Region



Alberta Budget 2008 -2012; Nichols Applied Management

3.3.3 Royalties

Royalties paid on bitumen, natural gas, and conventional crude oil are estimated to amount to approximately $7.3 billion, or 20%, of the total provincial government revenue in Alberta during the 2011-12 fiscal year (AB Budget 2012, Nichols Applied Management).

The NADC region contains a large proportion of the royalty-generating natural resources within Alberta, including:

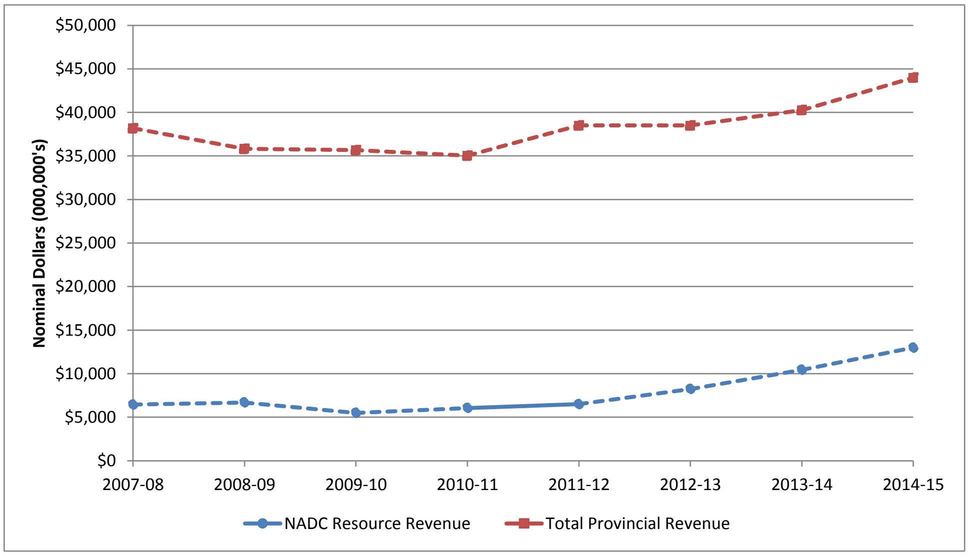
- 100% of the provincial oil sands production;
- approximately 30% of natural gas production; and
- approximately 30% of conventional oil production.

Of the total $7.3 billion, $5 billion (68%) is estimated to have been generated by the royalties paid on the extraction of resources from within the NADC region. Specifically:

- $4.1 billion from oil sands bitumen;
- $292 million from natural gas; and
- $650 million from conventional oil (Nichols Applied Management, ERCB 2010, AB Budget 2012).

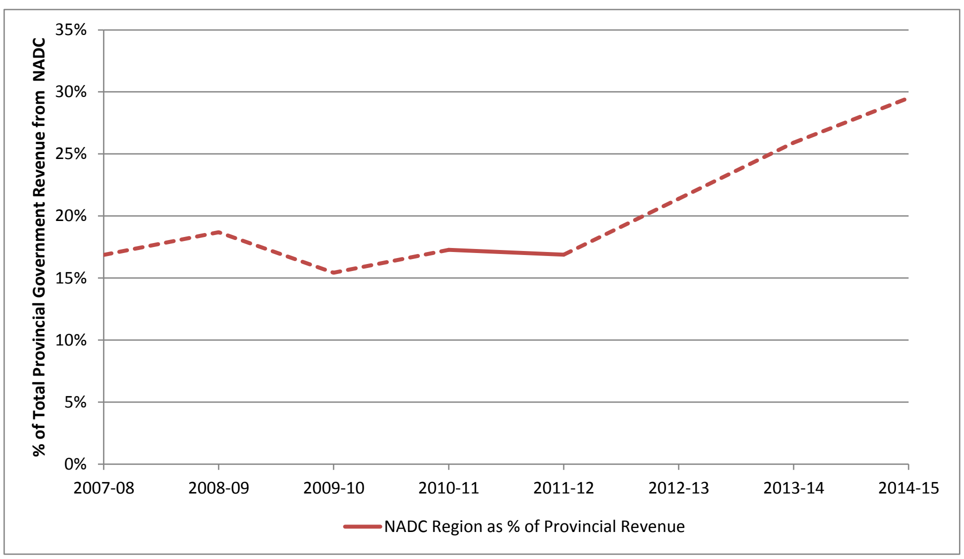
Figure 3.5 shows the past and future forecast of resource revenue from the NADC consistent with pricing assumptions outlined in the 2012 provincial budget[15]. Figure 3.6 illustrates the past and future forecast proportion of total government revenue generated within the NADC region.

Figure 3.5: NADC and Total Provincial Government Revenue



Forecast indicated in dashed line
AB Budget 2008-2012; Nichols Applied Management

Figure 3.6: Proportion of Total Provincial Government Revenue from Within the NADC Region



Forecast indicated in dashed line
AB Budget 2008-2012; Nichols Applied Management

15 WTI increase from $83.38/bbl (USD) in 2010-11 to $108.25/bbl (USD) by 2014-2015
WCS increase from $66.70/bbl (CAD) in 2010-11 to $92.94/bbl (USD) by 2014-2015
NASTGAS increase from $$3.28/GJ (CAD) in 2010-11 to $4.25/GJ (CAD) by 2014-15
It should be noted that production levels, and thus royalty forecasts, are subject to a great deal of uncertainty as outlined in section 4.1.

3.3.4 Summary

Taken together, the income taxes and resource royalties collected from within the NADC region represent approximately 17% ($6.5 billion) of the revenue anticipated to be collected by Alberta's provincial government (including federal transfers) in the 2011-12 fiscal year (AB Budget 2012, Nichols Applied Management). This is in line with the proportion of total revenue contributed by the NADC between the 2007-08 and 2010-11 fiscal years, but well below the levels anticipated by the provincial government whose forecast implies that the regional contribution of the NADC will reach 30% of total government revenue by the 2014-15 fiscal year as shown in Figure 3.5. This increase in the share of total government revenue coming from the NADC region is due primarily to the assumption of a rapid rise in oil sands royalties on the part of the government. It should be noted that a less than anticipated increase in oil sands production, due either to lower prices, shifting attitudes, or limited pipeline capacity will limit the proportion of government revenue generated by the oil sands and shift the burden of paying for public services to tax payers.

4. Key Factors Affecting the Future of the NADC Economy

The analysis of the trade relationships presented in this report reveal that the NADC region exports the vast majority of its fossil fuels, grain, and forestry products. As a region largely dependent upon the export of goods, local industries are generally subject to market forces operating on a much larger scale – in many cases at the international level. Also, the overall economic health of major trading partners, both domestically and internationally, will have considerable influence on the growth of the regional economy.

As a highly specialized economy, the level of economic activity within the NADC region is highly responsive to changes in the demand for a handful of goods, particularly oil sands bitumen. As such, this section will begin with an examination of possible changes to key industries within the NADC followed by a discussion of emerging industries and new opportunities in the region.

4.1 Oil Sands

As was demonstrated through the identification and examination of the key industries in the NADC (Section 2.3.4), the driving force behind continued economic growth in the region is the future development of the oil sands. There are many forces at play that may affect the pace of development in the oil sands. They include:

- the internationally determined price of oil, and thus, oil sands bitumen;
- popular attitudes and official government policy towards consuming oil produced from Alberta's oil sands, particularly as consumers weigh the trade-offs between greenhouse gas emissions and bitumen extraction; and
- increasing capital costs of constructing new oil sands projects.

Price of Bitumen

The majority of oil sands producers sell diluted bitumen, a variant of conventional crude that is much more viscous and contains more impurities than the more commonly traded West Texas Intermediate (WTI) crude oil. As such, diluted bitumen trades at a discount to WTI. Furthermore, WTI is priced in American dollars on an international market whereas the sale of bitumen, and thus revenues to oil sands firms, is denominated in Canadian dollars. Ultimately, the final price faced by oil sands producers is determined by:

- the global price of WTI per barrel (/bbl);
- the exchange rate between the American and Canadian currencies; and
- the discount between WTI and oil sands crude.

In addition to the uncertainty surrounding the final price of bitumen, the profitability of oil sands projects is also impacted by changes in key input prices including labour, sustaining capital and, for in-situ projects, natural gas. The volatility of natural gas prices introduces a great deal of variability into the operating costs of in-situ projects.

These sources of uncertainty all influence the profitability of oil sands projects and thus the level of future expansion, current production levels, and royalties paid by firms in the region.

Popular Attitudes and Government Policy

Environmental concerns may also contribute significantly to the pace of future oil sands development. Bitumen from Alberta's oil sands is seen by many to come at a very high environmental cost, both in terms of greenhouse gas intensity as well as land disturbance. There have been discussions by foreign governments actively discouraging the consumption of oil from the oil sands and international concern expressed over the continued development of the resource. If reasonable substitutes become available and/or these attitudes prevail, the demand for Alberta's bitumen would decline and thus the pace of development in the oil sands will also slow.

Objections to the environmental tradeoffs made with oil sands production are often countered by arguments in favour of energy development in countries, such as Canada, with a stable democratically elected government and a transparent regulatory regime.

Increasing Capital Costs

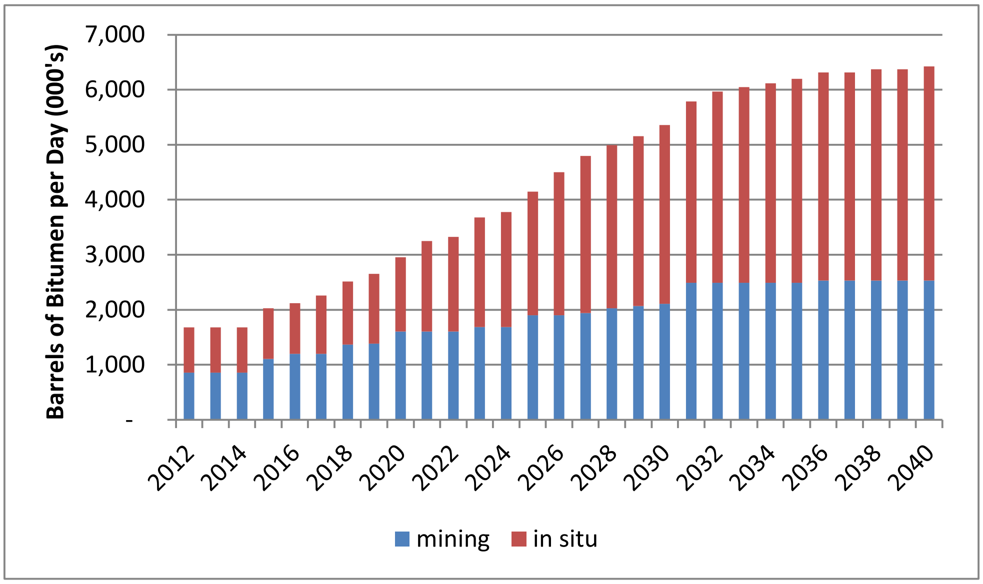
As the development of the oil sands increases, the competition for key inputs drives up initial costs of development in the oil sands. In so far as these increases are not offset by an increasing price of oil, firms may choose to invest in extraction projects elsewhere in the world.

Future Production

The provincial government has a generally positive outlook with respect to the prices and the general business environment faced by oil sands producers and expects the price of WTI in Canadian dollars to reach nearly $93/bbl by 2015 and non-conventional crude production to rise from the current 1.8 million barrels per day to just over 2.4 million barrels per day (AB Budget 2012). A more conservative forecast based on a real price (2012 in Canadian dollars) of $84/bbl of WTI in 2015 has been estimated by Nichols Applied Management and can be seen in Figure 4.1. While this slightly lower price may limit the pace of development relative to the provincial forecast, production from Alberta's oil sands is anticipated to hit 2 million barrels per day by 2015 and continue growing to ultimately reach 6 million barrels per day by 2032. The majority of growth in the oil sands is expected to come from in-situ production technologies such as steam assisted gravity drainage (SAGD) as very few mineable bitumen deposits remain.

This future growth is contingent upon the ability of oil sands producers to deliver their product to foreign markets. Sufficient pipeline capacity out of the region to upgraders, refineries, and shipping ports is necessary for continued growth in the oil sands.

Figure 4.1: Forecast Oil Sands Production



Nichols Applied Management

Oil Sands Production Technology

The growth forecast shown in Figure 4.1 is particularly interesting when considered in conjunction with the oil sands trade relationships defined in section 3.2.1. In 2002, there was roughly a 60/40 split between mining and in-situ oil sands production and by 2041, this ratio is expected to be reversed (CERI, Nichols Applied Management). Although the historic procurement patterns outlined in Tables 3.1 and 3.2 indicate that in-situ projects favour suppliers in Alberta and Canada relative to mining, the capital expenditure needed to build a mine is roughly three times that of an in-situ project on a per barrel basis. A shift towards in-situ extraction will take place but the procurement patterns demonstrated by mines will continue to account for a considerable portion of oil sands related spending.

Approximately $250 billion ($150 billion mining, $100 billion in-situ, real $2012) in capital expenditure will be required to meet the production levels achieved in 2040 as shown in Figure 4.1. If the supply ratios in Tables 3.1 and 3.2 hold, roughly:

- $130 billion will be spent procuring goods, services, and labour within Alberta;
- $50 billion in the rest of Canada; and
- $60 billion internationally.

It should be noted that these supply ratios are subject to uncertainty as technological changes and international market forces may change and thus influence the procurement of goods, services, and labour for oil sands projects.

4.2 Agriculture and Forestry

As with the oil sands, the agriculture and forestry sectors within the NADC region, and indeed elsewhere in Alberta and Canada, are subject to forces beyond the control of industry members or any level of government. As discussed in section 2.4.2, natural phenomena such as drought, BSE, and pine beetle infestation have the ability to significantly alter production levels for these industries very quickly.

Agriculture

A series of positive tests for BSE in Alberta cattle since 2003 has reduced the global appetite for Alberta beef. This drop in demand has manifested itself in the NADC region as diminished local cow/calf production and subsequently reduced local demand for feed grain. The structure of the agricultural industry has the potential to change as small farms that have been financially squeezed by events such as BSE and drought may be purchased by large commercial producers, ultimately reducing the number of family run operations. While the overall output of the industry is unlikely to change substantially, the shift to large commercial operations may slightly reduce the demand for labour in the agriculture sector.

Changes to the Canadian Wheat Board (CWB) will also significantly impact the agriculture sector within the NADC. The CWB formerly acted as a single buyer of wheat and barley from farmers in Canada and then, in turn, marketed those grains to buyers around the world. The federal government has recently moved to allow individual farmers to market their own grains through channels outside the CWB. This change is expected to lead to increased competition amongst grain producers which will lower the prices faced by consumers. This increased competition will likely drive less efficient producers from the market, temporarily causing unemployment as the sector adjusts.

Forestry

The demand for forestry goods on a global level has been negatively impacted by the recent global recession in so far as the resulting over-supply of housing has greatly reduced the demand for timber related to new home construction (Roberts 2011). Furthermore, trends towards the electronic consumption of what was once print media has reduced the demand for pulp and paper products by the publishing industry. Despite these reductions in the demand for traditional products, the forestry industry has the opportunity to grow and evolve in a number of ways. They include:

- converting biomass (wood fibre) into solid or liquid fuel for bio-energy production as well as bio-chemicals for solvents and plastics; and

- producing cross-laminated timber – a wood-based engineered substitute for certain structural building elements currently fabricated of concrete, masonry, and steel (Roberts 2012, FPAC 2010).

It should be noted that the production of biomass related goods and engineered timber products are less labour intensive activities than traditional forestry activities (FPAC 2010). Therefore, while the industry may evolve and expand into new markets, the level of job creation will likely be lower than an expansion of the existing forestry sector.

4.3 Future Opportunities

There are a number of opportunities for growth in the NADC regional economy, both in expansion of established industries and in the development of emerging sectors. They include:

- Expanding the support industries for the oil and gas sector within the NADC. The current construction strategy for some oil sands firms is to source fabricated modules from outside the region and have them assembled on site. Increasing the region's capacity to fabricate key components will allow more economic benefits to be captured locally. The current shortage of resident labour in the region may pose an obstacle to expansion in this industry.

- Encouraging the further construction of upgrading and refining capacity within the region and the province overall. Alberta currently produces roughly 1.7 million bbl/d of bitumen and has upgrader and refinery capacity of approximately 1.2 million bbl/d and 430,000 bbl/d respectively (AB Energy 2011). Encouraging firms to construct additional upgraders and refineries in Alberta would lead to additional long term jobs in the province and possibly the NADC region.

- Diversifying the output of the forestry industry to include the aforementioned wood-based bio-fuels and engineered structural products. Expansion into bio-fuels offers the opportunity for Alberta to produce energy that is less greenhouse gas intensive than oil sands and coal.

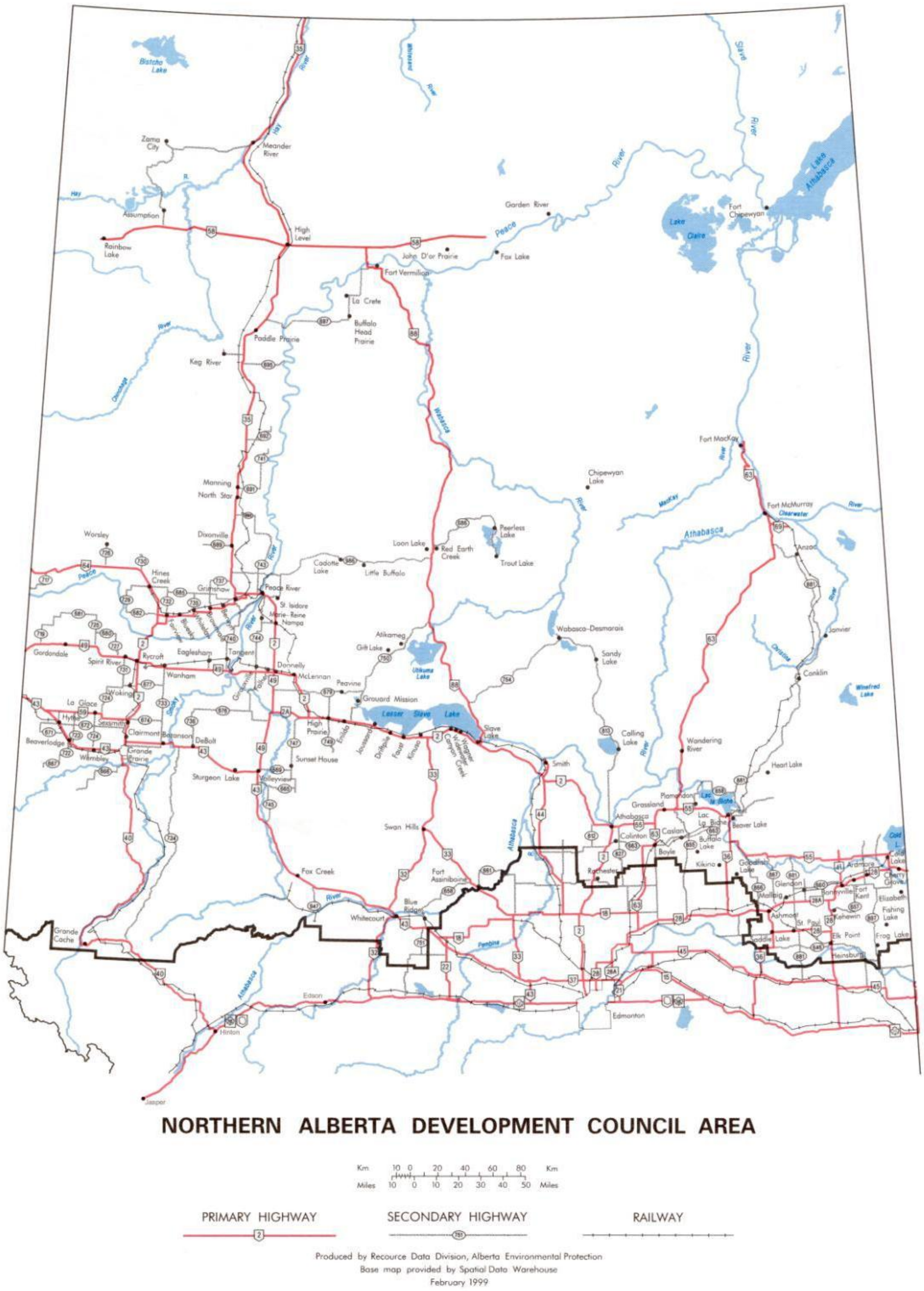
- The development of non-energy mining. The Alberta Geological Survey has identified "a tremendous potential for the discovery of an economic[ally feasible] diamond deposit" in northern Alberta (AGS 2012). Also, iron deposits are currently being delineated and assessed in the eastern portion of the NADC region which may lead to a commercially viable extraction operation.

- Encouraging the development of alternative energy sources and the continued commercialization of applied research being developed in the region. Examples include agricultural yield research, on-site upgrading, and innovative in-situ extraction techniques such as Toe-to Heel Air Injection and chemically enhanced SAGD.

Despite the need for labour in many industries operating throughout the NADC region, the Aboriginal workforce remains underemployed. There is an opportunity for industry and government to work with Aboriginal groups to engage, train, and generally support those Aboriginals who wish to engage in the wage economy.

A. Appendix - NADC Region, Community Listings

Figure A-1: NADC Region



Source: NADC Annual Report 2010-11

Cities and Towns	**Municipal Districts**	**First Nations**	**Métis Communities**
Rainbow Lake	Mackenzie County	Dene Tha'	Paddle Prairie
High Level	Wood Buffalo National Park	Beaver	Peavine
Manning	Regional Municipality of Wood Buffalo	Little Red River Cree	Gift Lake
Fort McMurray	Clear Hills County	Smith's Landing	East Prairie
Grimshaw	Northern Sunrise County	Tall Cree	Buffalo Lake
Peace River	M.D. of Opportunity	Mikisew Cree	Elizabeth
Fairview	Saddle Hills County	Athabasca Chipewyan	Fishing Lake
Spirit River	Birch Hills County	Fort MacKay	Kikino
Falher	M.D. of Big Lakes	Loon River Cree	
Sexsmith	M.D. of Lesser Slave River	Horse Lake	
McLennan	Athabasca County	Woodland Cree	
Beaverlodge	Lac La Biche County	Whitefish Lake	
High Prairie	Grande Prairie County	Fort McMurray	
Wembley	M.D. of Greenview	Duncan's	
Grande Prairie	Woodland County	Lubicon Lake	
Slave Lake	M.D. of Bonnyville	Kapaweno Cree	
Valleyview	St. Paul County	Bigstone Cree	
Athabasca	M.D. of Smoky River	Chipewyan Prairie	
Lac La Biche	M.D. of Spirit River	Heart Lake	
Cold Lake	M.D of Peace	Sturgeon Lake	
Swan Hills	M.D. of Fairview	Sucker Creek	
Fox Creek	M.D of Northern Lights	Driftpile	
Bonnyville		Sawridge	
Whitecourt		Swan River	
Grande Cache		Beaver Lake	
St. Paul		Cold Lake	
Elk Point		Kehewin	
		Saddle Lake	
		Frog Lake	

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