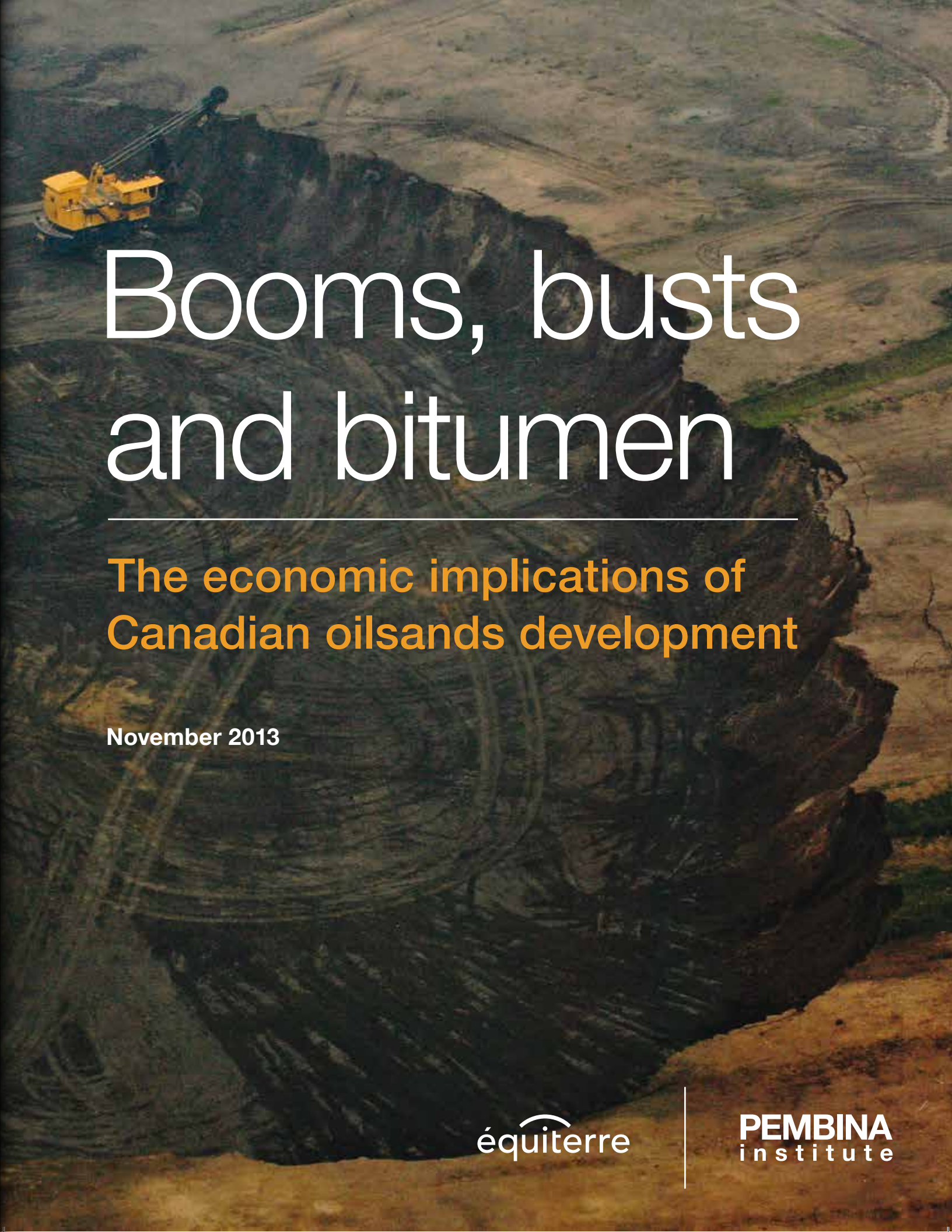

Booms, busts and bitumen

The economic implications of Canadian oilsands development

November 2013

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Booms, Busts and Bitumen: The economic implications of Canadian oilsands development
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- promoting pragmatic policy approaches for governments to avoid dangerous climate change, such as increasing the amount of renewable energy plugged into our electricity grids;
- and — recognizing that the transition to clean energy will include fossil fuels for some time — advocating for responsible development of Canada's oilsands and shale gas resources.

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Foreword

Some may think that the debate between economists and environmentalists over the benefits of the oilsands was inevitable. For economists, a natural resource boom translates into increased demand for our products in international markets, thus improving Canada's terms of trade. The net result for Canadians must therefore be positive. Environmentalists, on the other hand, don't accept gross domestic product (GDP) as a complete measure of well-being in the same way that economists do. Their version of green GDP incorporates the negative environmental effects of resource development. From an environmental point of view, the oilsands are probably the most costly way to produce "black gold."

It would be wrong to think that economists have formed a united front to defend the economic impacts of a resource boom. There is an ongoing, bitter debate among economists as to the benefits, risks and potential costs of making a nation's economy reliant on non-renewable resources. Some even use terms like "disease" and "curse" to describe the negative consequences of resource booms.

The Pembina Institute and Équiterre's *Booms, Busts and Bitumen* taps into that vein. Economic questions are at the heart of this report, whereas purely environmental ones are kept in the background. The report seeks to quantify the positive and negative impacts of Canada's petroleum windfall, and to identify the winners and losers. From that standpoint, it makes a useful contribution to the debate currently raging over the consequences of a natural resource boom. It also contrasts with some other contributions that have added heat, but not much light, to the debate.

Dutch disease is just one possible downside of a resource boom. The appreciation of a country's exchange rate from a boom reduces the competitiveness of other export industries. A short-term resource boom can therefore crowd out other sectors that have long-term growth potential, and would otherwise generate ongoing economic benefits. This phenomenon turns into a "disease" when the resource boom ends and the manufacturing industry has hollowed out. At that point, there's nothing left but ghost towns.

It's too early to know what Canada's economy will look like when the oilsands boom is over. However, the conditions required for Dutch disease to develop are present in Canada. This report shows that the oilsands boom does not benefit all Canadians. Other economic sectors are being squeezed out. The "echoes" of the boom that can be heard in Ontario, Quebec and the Maritimes sometimes strike a false chord.

One might expect an institute that is dedicated to advancing clean energy to simply contrast the environmental costs of oilsands expansion with the economic benefits. But *Booms, Busts and Bitumen* — as well as its prequel report, *In the Shadow of the Boom* — goes further. It is a gold mine of statistical information for those debating the economic impacts of our petroleum windfall. The oilsands boom has defined Canada's economic development since the beginning of the millennium. Canadians owe it to themselves to understand it better.

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Executive summary

In May 2012, the Pembina Institute released the report *In the Shadow of the Boom: How oilsands development is reshaping Canada's economy*, which provided insight into some of the economic upsides, downsides and risks of oilsands development. Over the past 18 months, the debate around the economic impacts of the oilsands has continued to grow, with new evidence and ideas coming from the Bank of Canada, international organizations, and leading Canadian policy groups. The link between increased production from the oilsands and increased oil transportation — with its related safety and environmental risks — is also receiving greater scrutiny in Central and Eastern Canada. More pipelines are being proposed in those regions, including the Energy East pipeline from Alberta to New Brunswick and the Line 9 reversal from Ontario to Quebec, while oil transport by rail is under examination in the wake of the Lac Mégantic disaster.

This report builds on the analysis from *In the Shadow of the Boom*. With the debate around new pipeline development shifting eastward across the country, there has been a greater push from both government and industry to convince Canadians of the economic benefits of the oilsands. This report offers a broader view. Our objective is for Canadians, industry, and government to develop a broad understanding of the suite of economic implications accompanying pipeline approval, and increased capacity for rapid oilsands expansion.

As a country, we need to recognize there are diminishing marginal benefits from oilsands development, and that too much development may make us worse off. There needs to be a positive and constructive discussion that considers the economic, social and environmental pros and cons of oilsands development. In this report, we aim to provide insights that will inform the economic piece of this discussion.

Oilsands expansion has brought significant economic benefits to specific parts of Canada. In 2011–12, the Government of Alberta collected $4.5 billion in royalties from oilsands production, representing 38.7 per cent of non-renewable resource revenue and 11.4 per cent of total government revenue.[1] The Government of Canada collected $1.5 billion in taxes from all oil and gas extraction and support activities, representing 0.6 per cent of total government revenue.[2-3-4] Moreover, in 2012, the oilsands provided direct employment to 22,340 workers.[5] If counting direct, indirect and induced employment, approximately 390,000 Canadian jobs were linked to the oilsands in 2010.[6 7] This represented 2.3 per cent of all jobs in Canada.[8]

Over the past 10 years the rising commodity price index, of which the price of oil is a major contributor, has been matched by an appreciating Canadian dollar. Rising from a low of US$0.61 in 2002 to a high of US$1.10 in 2007, it has been hovering around parity for the past 2.5 years.[9] The increasingly linked relationship between the price of oil and the Canadian dollar has led it to be dubbed a "petro-currency." Recent analysis suggests that surging commodity prices explain as much as 40 to 75 per cent of the dollar's rise.[10-11-12]

There are many potential benefits to a stronger Canadian currency: consumers are able to purchase foreign goods or travel to foreign countries for less, and Canadian manufacturers will encounter a reduction in imported input costs. In reality, however, many of the potential benefits of the high dollar are being outweighed by the downsides, particularly those related to a loss in export competitiveness.

When the real exchange rate of a country's currency appreciates to the point where the country's manufactured goods become too expensive to export, this can lead to the decline or even demise of the manufacturing sector.[13] This

scenario was observed in the Netherlands in the 1970s and consequently is now referred to as "Dutch disease." Whether Canada is currently experiencing Dutch disease is a topic of strong opinions and significant debate. Recent statistics show that Canada's manufacturing sector is declining — this much is difficult to refute. How much of this decline can be attributed to the rising Canadian dollar remains a point of debate. Dutch disease detractors point out that many OECD countries are seeing a similar manufacturing sector decline, and that Canada's experience is largely attributable to a global economic restructuring.[14-15] They also argue that Canadian manufacturers have in many cases successfully adapted to the rising Canadian dollar by increasing their use of foreign-produced inputs.[16-17] On the other side of the debate, supporters argue there is a strong link between the high Canadian dollar and manufacturing sector decline, and more so, that the loss in export competitiveness is leading to a decline in productivity and innovation.[18-19]

Since 2001 there has been a considerable drop in exports from many of Canada's manufacturing sectors.[20] Part of this change is attributable to the rise of low-cost manufacturing countries and the weak U.S. economy. However, a recent report by the International Monetary Fund finds the rising Canadian dollar has also played a role.[21] Along with falling export competitiveness, Canadian manufacturers also face rising domestic input costs and lagging productivity growth.[22] These factors pose a significant risk to Canada's long-term economic competitiveness.

Most impacted by the declining manufacturing sector are Canada's manufacturing provinces. Looking at real GDP growth between 2000 and 2012, Ontario and Quebec (at 19 and 20 per cent, respectively) lagged behind the rest of the nation. Meanwhile, Newfoundland and Labrador, Alberta and British Columbia all led the provinces with over 30 per cent growth.[23] The ascendant commodity provinces are also increasing their dominance of Canada's export market, outperforming exports from the traditionally strong manufacturing base in central Canada.[24]

Taking into account this new analysis, we maintain our original conclusion from *In the Shadow of the Boom* — the simple diagnosis of Dutch disease fails to capture what is happening in Canada's manufacturing sector. Rather, the sector is being impacted by a host of domestic and international factors. To fully understand the challenges manufacturing is facing, it is necessary to acknowledge shifts in the global economy, but also to evaluate the indirect and downstream consequences of a resource boom that extend beyond the simple narrative of an appreciating currency that leads to a manufacturing sector decline.

Recent studies suggest that much of the economic benefits of oilsands development will remain concentrated in Alberta. A study by the Canadian Energy Research Institute suggests Alberta will realize 94 per cent of the GDP benefit and retain 86 per cent of jobs from oilsands investments and operations.[25] Based on CERI's analysis, the United States will receive benefits two times greater than what occurs in the rest of Canada. A more recent analysis by the Conference Board of Canada finds that Alberta will realize 70 per cent of the benefit from oilsands investment and retain 74 per cent of employment opportunities relative to the rest of Canada.[26]

Oilsands production also presents challenges for Alberta by placing its economy in a precarious and unpredictable position. Compared to all other provinces, the last 10 years have seen Alberta experience the greatest volatility in percentage change in GDP.[27] Accurately forecasting oil revenues remains a challenge, and has undermined the province's ability to take on long-term economic planning.[28] Alberta's overreliance on oilsands revenues was made painfully clear in early 2013 when it announced that it will receive $6.2 billion less in non-renewable resource revenues than anticipated — forcing the province to roll out an austerity budget amidst record high levels of bitumen production.[29]

By continuing to support and encourage an increasingly dominant role for the oilsands in the Canadian economy, the federal government is committing itself to a future track that might soon be the path less travelled by the rest of the world. As countries increasingly consider actions to address climate change, this will drive significant changes in production and consumption of energy, especially oil. Other countries are already taking advantage of opportunities in the clean energy sector; investment in renewable energy, and renewable energy capacity, have rapidly increased around the world in recent years.[30-31] Current federal and provincial policies around oilsands expansion show a lack of economic foresight that may ultimately limit the long-term competitiveness of Canada in a lower-carbon global economy.

In response to the economic downsides of oilsands development currently being observed, we provide four recommendations to government for near-term action to help steer Canada towards a sustainable energy future.

1. **Improve how the provincial and federal government manage one-time resource wealth.**

   The Government of Alberta and the federal government are direct beneficiaries of the economic growth associated with oilsands development. But as the relative contribution from this activity grows, so grows the risk to the government given the volatility of the global oil marketplace and its cyclical booms and busts. Both levels of government should be ensuring that one-time resource wealth is being used to generate long-term benefits, through either a savings fund or capital investments with a focus on reducing future fossil fuel dependency.

"Current federal and provincial **policies around oilsands expansion show a lack of economic foresight** that may ultimately limit Canada's long-term competitiveness."

2. **Consider a full set of costs and benefits of rapid oilsands development in project review and approval processes.**

   When evaluating the impacts of an oilsands development project, regulatory panels should complete a full cost-benefit analysis that considers the short-term and long-term economic and environmental implications of rapid oilsands development at the local, provincial and national level. This includes conducting non-market valuations of expected environmental damages, evaluating the economic costs and risks of rapidly developing a resource with high price volatility, and examining the economic benefits of a more moderated approach to development.

3. **Initiate a federal committee study on maintaining economic competitiveness with a high and volatile Canadian dollar.**

   The House of Commons Standing Committee on Industry, Science and Technology is well positioned to undertake a study on economic competitiveness and the high dollar. The study should look at trends in the restructuring of the Canadian economy and associated regional disparities, and aim to identify actions that the federal government can take to ensure a robust, diverse economy that supports economic growth and competitiveness across Canada.

4. **Transition to low-carbon industries throughout Canada.**

   If Canada is to compete in a burgeoning global low-carbon economy, and if it is to address some of the emerging regional economic divisions, then the federal government should play a key role in using energy and environmental policy to unite the country and position its economy for long-term success. The government can pursue this objective through numerous options, including eliminating preferential tax treatment for the oil and gas sector, introducing federal oil and gas regulations that put Canada on track to meet its 2020 emission reduction target, and developing a set of specific federal financial tools to encourage clean energy entrepreneurship.

1. Introduction

This report follows the groundbreaking Pembina Institute analysis behind *In the Shadow of the Boom: How oilsands development is reshaping Canada's economy*. Released in May 2012, at a time when the economic benefits of oilsands development were the focus of intense lobbying efforts by politicians and the energy industry, *In the Shadow of the Boom* offered a sober look at the other side of the balance sheet. This updated version of our initial report aims to address key issues and incorporate new perspectives that have emerged in the debate over the impacts of oilsands development on Canada's economy.

Since we published our initial report last spring, many thought leaders have added new analysis and commentary on this issue, including the International Monetary Fund (IMF), the Bank of Canada, Canadian International Council (CIC), Canadian Centre for Policy Alternatives (CCPA), the Organization for Economic Cooperation and Development (OECD), the Conference Board of Canada, the Macdonald-Laurier Institute (MLI), the University of Calgary's School of Public Policy and the University of Toronto's Mowat Centre.

Further, the conversation regarding oilsands and pipeline projects used to focus exclusively on Western Canada; recent proposals to run pipelines from the oilsands east to Quebec and New Brunswick have caused the conversation to broaden its focus. Many Eastern Canadians are concerned about the environmental and health risks that pipelines and rail transport of oil products pose to their communities, and there is significant debate over whether these projects should be approved. As part of this debate, it is also important to recognize that increased pipeline capacity means increased capacity for oilsands expansion. This has economic implications that will be felt across the country, impacting both Canada's current economic structure and its future path. The purpose of this report is to inform a national conversation about the economics of responsible oilsands development, and to encourage discussion around the economic opportunities that lower-carbon energy sources present for Canada's economy.

We recognize there are economic benefits that come with development of the oilsands. However, these benefits are not necessarily strictly increasing with the pace and scale of development. Rather, for government, industry and Canadians, there is a risk that the marginal benefits from continued oilsands development will be diminishing, and that too much development may make Canada worse off.

There will always be benefits — more jobs, more taxes, more royalties — but there are costs as well, many of which are increasing with the pace and scale of development. These include environmental damages along with economic downsides. Locally these are related primarily to the pace of development, while nationally, all of Canada is facing the spillover effects and long-term competitive risks that come from subtly shifting an increasing share of our limited resources towards oilsands development.

As oilsands expansion continues, we must consider how development can optimize benefits of the resource, achieve our international climate commitments, and meet science-based environmental limits. To do this, we need to have a positive and constructive discussion that considers the economic, social and environmental pros and cons of oilsands development. In this report, we recognize the need for this discussion, and aim to provide insights that will inform the economic piece.

Chapter 2 of this report lays the groundwork for a discussion of the economics of responsible oilsands development by providing the current context for this debate. Chapter 3 examines the links between an appreciating and volatile Canadian dollar and the price of oil. Chapter 4 provides an update on the research released since *In the Shadow of the Boom*, looking at the extent to which Canada's economy may be experiencing Dutch disease, as well as other challenges stemming from an appreciating Canadian dollar and a narrow focus on resource development. Chapter 5 delves into the sectoral and provincial fault lines being triggered by recent economic trends, and discusses both the near-term impacts and longer-term risks associated with Canada's current economic trajectory, and the role of oilsands development within it. Finally, Chapter 6 draws conclusions based on this research and suggests a path forward to support a constructive discussion and decisions about the future of our economy, with the aim of ensuring both a healthy environment and a thriving economy.

2. Assessing the economic benefits of oilsands development

Oilsands expansion in the last decade has been fuelled by high oil prices (Figure 1), supported by generous tax and royalty terms and an approval process that has prioritized rapid development, and grounded in the belief that prices will remain high, if not continue to increase.

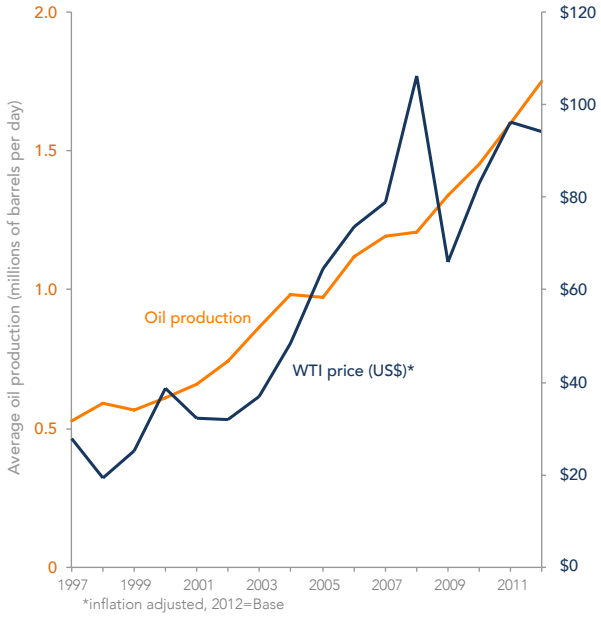


Figure 1. Oilsands production and price,[32] 1997-2012
Data source: Canadian Association of Petroleum Producers,[33] U.S. Energy Information Administration[34]

As the price of oil rises and oilsands production increases, so too does the level of economic activity generated by the oilsands industry. While Statistics Canada does not currently publish GDP figures for the oilsands sector specifically, figures for the oil and gas sector are informative. The total real GDP for the oil and gas industry as a whole (including the oilsands) was $93 billion in 2012, six per cent of total national GDP. The sector's GDP grew at a rate of 3.2 per cent from 2011 to 2012, 1.5 percentage points higher than the national average.[35-36]

Canada's oil and gas industry remains dominated by Alberta production. Total real GDP for the oil and gas industry in Alberta was $73 billion in 2012, contributing almost 79 per cent to Canada's total oil and gas GDP.[37] Within Alberta, the dominance of the oil and gas industry is even more pronounced, with the sector accounting for over 26 per cent of total real provincial GDP in 2012.[38]

In Canada, non-renewable resource revenue from royalties and land leases are collected by provincial and territorial governments. In 2011–12, Alberta collected over $11.9 billion in non-renewable resource revenue, $4.5 billion of which came from oilsands production.[39] Royalties from oilsands production represented 11.4 per cent of Alberta government revenues in 2011–12. Due to declining world oil prices over much of 2012, and an increasing discount between the North American (West Texas Intermediate) and Alberta (Western Canadian Select) prices of oil, oilsands royalties are expected to decline sharply in both 2012–13 and 2013–14, falling by almost 25 per cent to approximately $3.4 billion.[40-41] While anticipated revenues from oilsands production are declining, the relative importance of oilsands as a source of non-renewable resource revenue is increasing. Oilsands royalties accounted for 39 per cent of non-renewable resource revenue in 2011–12, and are expected to rise to 46 per cent in 2013–14, and 68 per cent by 2015–16.[42-43-44]

The oilsands also generate revenue for the federal government, primarily through corporate income taxes. Canada's entire oil and gas sector paid $1.5 billion in federal income tax in 2011 (0.6 per cent of total federal government revenues for the 2011/12 fiscal year). [45-46-47]

There is limited publicly available data on the historic employment levels related to the oilsands. In 2012, there were 22,340 workers directly employed in oilsands operations in Canada, representing approximately 0.13 per cent of all Canadian jobs.[48-49] Modelling by the Canadian Energy Research Institute (CERI) has suggested that in 2010, 390,000 direct (including operations and construction), indirect and induced jobs in Canada can be attributed to the oilsands industry.[50-51] This represented 2.3 per cent of all jobs in Canada in 2010.[52]

While historic economic growth in the oilsands sector has garnered significant attention in recent years, the focus is now shifting to projections of future growth. CERI and the Conference Board of Canada have both recently published reports that outline the impacts of oilsands projects on the Canadian economy.

CERI's report uses a proprietary input-output model to project key economic impacts from oilsands operations over the period of 2010 to 2035.[53] It models numerous scenarios for development; we report the results from Case 3 that assumes export capacity will reach 4.8 million

Table 1. Projected economic impacts of oilsands expansion

	CERI	CONFERENCE BOARD OF CANADA
Time period examined	2010-2035	2012-2035
Model parameters	Investment, reinvestment and revenues from oilsands operations	Investment to support oilsands development
Oilsands investment (2010 dolars)	$3,208 billion	$364 billion
GDP impact (2010 dollars)	$3,317 billion	–
Employment (direct, indirect and induced) (person-years)	17.7 million	3.2 million
Total tax receipts (direct and indirect) (2010 dollars)	$698.2 billion (federal and provincial-municipal)	$79.4 billion (federal and provincial)

barrels per day (mmbd) by 2016, and future development will be constrained by this capacity.[54] The Conference Board of Canada's report uses Statistics Canada's input-output model to project impacts from oilsands investment over the period of 2012 to 2035.[55] It assumes oilsands production will reach 4.9 mmbd by 2035.[56] Key results from both studies are summarized in Table 1.[57]

At first glance, the results from both studies are impressive. However, it is critical to remember that the use of an input-output model to forecast future economic impacts includes significant limiting assumptions. The Conference Board of Canada report says, "The forecast specifically assumes that the resource situated in the oil sands will be developed under current market conditions, but many different situations could arise that will affect the level of investment over the next 25 years."[58] They note that future investment may be influenced by growing global concern about climate change, a potentially decreasing path for global oil demand, the emergence of alternative sources of oil production, and input capacity constraints. An input-output model also does not allow for changes in the Canada–U.S. exchange rate, and it assumes that current supply chain linkages in the Canadian economy will not change over time. The models therefore do not account for economic decline in other sectors, which dampens much of the economic gains of the oilsands industry. Overall, input-output models are not designed to consider or produce figures representing the economic costs associated with booming oilsands development in addition to the economic gains. Relying on such modelling to justify increased oilsands expansion presents a false picture of the economic benefits of such development.

Of course, there have been and will continue to be tangible economic benefits from oilsands development to the Canadian economy. As oilsands production continues to increase, those benefits will also increase, creating an incredible boom for the oilsands sector. But what lies in the shadow of the boom? Are there negative economic impacts that will be created by this boom? What impact will the boom have on Canada's broader economy? The following chapters tackle these important questions.

3. A petro-currency in Canada

Over the past 12 years the value of the Canadian dollar has appreciated steadily and dramatically relative to the U.S. dollar, from a low of US$0.61 in 2002 to a high of US$1.10 in 2007;[59] it has been hovering around parity for the past 2.5 years. But the rapid rise of the Canadian dollar, colloquially referred to as the loonie, has organizations like the Bank of Montreal and the OECD suggesting that its real worth is lower than where it has been trading. Current estimates place the loonie at anywhere from five to 25 per cent overvalued, with speculators pushing its value up.[60-61] This overvaluation significantly reduces Canada's export competitiveness, making Canadian products appear five to 25 per cent overpriced relative to their foreign competitors.

The increasingly linked relationship between the price of oil and the Canadian dollar has led some observers to dub it a "petro-currency." As is clearly illustrated in Figure 2, this rise in the value of the Canadian dollar has closely followed trends in the price of oil.[62]

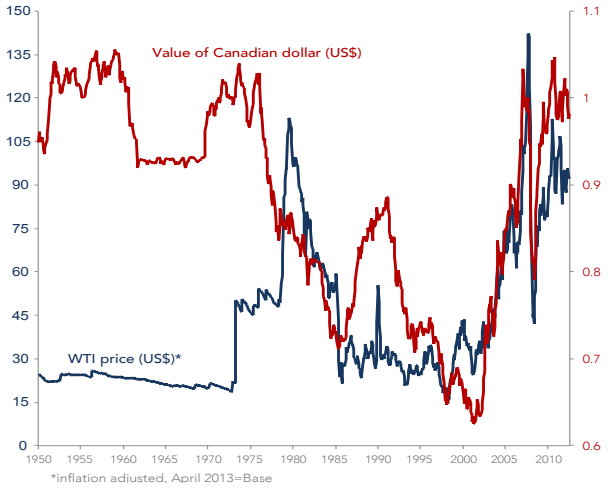


Figure 2. Price of West Texas Intermediate compared to Canada–U.S. exchange rate, 1950–2012
Data source: Statistics Canada,[63] Economagic[64]

In 2006, analysis by Desjardins Economic Studies found that the correlation between the price of oil and the value of the Canadian dollar had never been higher, concluding, "…the Canadian dollar remains first and foremost a natural resource currency."[65] Similarly, in early 2012, CERI's regression analysis on historical data found an 82 per cent correlation between oil prices and the Canada–U.S. exchange rate.[66] The period from May 1999 to April 2013 shows an even stronger correlation of 86 per cent.[67]

A 2013 IMF analysis looks more broadly at the link between surging commodity prices in Canada and the exchange rate, finding that from 2000 to 2007, 75 per cent of the total appreciation in the Canadian dollar can be explained by the combined effect of rising energy and metal prices.[68] Looking forward, the analysis estimates that, in the long run, a one per cent increase in the price of energy will lead to an approximate 0.11 – 0.16 per cent appreciation of the Canadian dollar against the U.S. dollar.[69] While most forecasts show oil prices decreasing in the short term, two of three long-run forecast scenarios from the U.S. Energy Information Administration show oil prices returning to an increasing path within the next two years.[70] The IMF analysis suggests that should either of these scenarios materialize, the loonie will continue to appreciate. This would compound the challenges of a high dollar that have already become apparent in many parts of Canada's economy.

In 2012, Mark Carney, then governor of the Bank of Canada, rejected the idea that the loonie is a petro-dollar, suggesting this oversimplifies a complex economy.[71] Other export commodities, notably metals and minerals, have also been increasing in value, and have contributed to the Canadian dollar's appreciation.[72] Looking at the period from 2002–2012, the Bank of Canada's analysis suggests increasing commodity prices can explain 50 per cent of the loonie's rise.[73] The remaining increase is accounted for by a weak U.S. dollar (40 per cent) and the perception of Canada globally as a low-risk destination for investment funds (10 per cent).[74]

A 2012 paper from the journal *Resource and Energy Economics* also identifies a positive relationship between commodity prices and the appreciating Canadian dollar. The paper considers the period from 2002–2007, during which the Canadian dollar appreciated by 48 per cent against the U.S. dollar. The analysis concludes that 42 per cent of this appreciation is attributable to the strengthening of the Canadian dollar, driven by the resource boom, and 58 per cent is due to the weakening of the U.S. dollar.[75]

There are many potential benefits to having a stronger currency; for example, consumers are able to purchase foreign goods or travel to foreign countries for less, and Canadian manufacturers should encounter a reduction in the cost of imported inputs. This is particularly relevant in Canada, as Canadian businesses import over 40 per

"In reality, however, a rising currency doesn't help individuals and businesses in equal measure. **Many of the potential benefits of the high dollar are being outweighed by the downsides.**"

cent of the primary and manufactured inputs that they use in the production process.[76] In theory, Canadian companies can also (if they choose) upgrade machinery and equipment from foreign suppliers more cheaply, thereby enhancing productivity.

In reality, however, a rising currency doesn't help individuals and businesses in equal measure. Many of the potential benefits of the high dollar are being outweighed by the downsides. Analysis by economists W. Erwin Diewert and Emily Yu finds that multifactor productivity, a measure of the change in output per unit of combined inputs, averaged a negative growth rate of -0.04 per cent per year in Canada over the 2000–2008 period.[77] A recent paper from the University of Calgary School of Public Policy suggests this decline may be indicative of a struggling export sector that "is unable to take advantage of returns to scale of production or export intensity."[78] Investment in capital in Canada's manufacturing sector has mostly followed a downward trend since 2000, and manufacturing's share of total investment has fallen from 14.0 per cent in 2000 to 8.4 per cent in 2012.[79] A recent report from the Mowat Centre states that low capital investment is due to the weak demand for Canadian goods and services that results from a high dollar.[80] The link between the high dollar and increasingly apparent struggles in Canada's manufacturing sector will be further explored in the upcoming sections.

4. The continuing debate over Dutch disease

When the value of a country's currency is closely correlated with the value of a commodity, it can lead a country to contract what is often referred to as "Dutch disease." This does not imply the oilsands are a disease; rather, the term was coined by *The Economist* and meant to describe a phenomenon that occurred in the 1970s in the Netherlands, when the country discovered and began to aggressively develop offshore natural gas.[81-82] Dutch disease occurs when the exchange rate of a country appreciates to the point where the country's manufactured goods become too expensive to export, ultimately leading to the decline or even demise of the manufacturing sector. [83]

While the Pembina Institute report *In the Shadow of the Boom* surveyed the literature over the past 20 years on the extent of Dutch disease in the Canadian economy, additional analysis has been published subsequent to the report's release.[84] As was the case with the previous literature, there is consensus in the new analysis that Canada meets the necessary condition for Dutch disease, a positive correlation between the price of oil and the value of the Canadian dollar. As discussed in Chapter 3, recent studies estimate the rising price of oil explains anywhere from 40 to 75 per cent of the recent appreciation of the Canadian dollar. The debate is not over whether there is a positive relationship between the price of oil and the value of the Canadian dollar, but rather, how strong the relationship is, and whether it is good or bad for Canadians, and Canada's economy.

The new analysis also agrees that there has been a recent decline in Canada's manufacturing sector. It is worth noting that Canada is no exception in this regard. Rather, it is widely acknowledged that many advanced economies throughout the world are facing declining manufacturing sectors. What is being debated in Canada is the role of oilsands development and an appreciating currency on the rate of manufacturing's decline. In other words, the lack of consensus is currently with regard to whether Canada is suffering from the consequences of Dutch disease.

In 2012, the Bank of Canada discussed Dutch disease in two speeches by then-governor Mark Carney.[85-86] In the second speech, Carney came out against the notion that Dutch disease exists in Canada, stating that "Canada's economy is much more diverse and much better integrated than the Dutch disease caricature."[87] Despite this official policy stance, Carney acknowledges that one-third of Canada's manufacturing sector decline is attributable to the higher loonie and a corresponding lack of export competitiveness. Carney attributes the remaining two-thirds of the decline to a global economic restructuring.[88] He also recognizes a link between struggling exports and the high loonie, stating that Canada's strong currency explains 20 per cent of its declining world export share since 2000. [89]

A Spring 2013 report by the School of Public Policy at the University of Calgary approaches its evaluation of Dutch disease from a similar perspective as the Bank of Canada. The analysis acknowledges that rising commodity prices have played some role in manufacturing sector decline, but states the larger contributors to be poor productivity performance, and the out-sourcing of manufacturing jobs to low-income countries like China, accompanied by a transition to increased employment opportunities in finance, high-tech and other industries.[90] This latter contributor is seen to represent a sectoral shift, similar to what is being observed in other OECD countries, and to be mostly independent of oilsands development and an appreciating currency.

While the rise of China and other low-cost manufacturing locales has contributed to an economic restructuring in many OECD countries, Canada is arguably unique in both its resource boom and its geographical size. Both these factors have contributed to an increasing economic disparity between different provinces. In 2007, a House of Commons Standing Committee acknowledged that Canada's decline in manufacturing is similar to the pattern displayed in other OECD countries, but also stated clearly that "In Canada, another structural change, the rise in the relative importance of the resources sector, is also playing a role."[91] Furthermore, comparisons that use national level data to compare indicators of manufacturing decline in Canada to other OECD countries run the risk of misrepresenting the full extent of the decline in the provinces with the strongest manufacturing bases, most notably Quebec and Ontario.

A more recent Fall 2013 report, also from the University of Calgary School of Public Policy, looks at the decline in the manufacturing sector over the period of 2002–2008. It argues that most lost manufacturing jobs were lower-paying, and that overall, workers are better off as a result of new employment opportunities and higher real wages in both the manufacturing sector and the economy as a whole.[92] It is important to recognize, however, that the upward pressure on wages and

new employment opportunities are stemming largely from investment in the oilsands. As will be discussed further in upcoming chapters, the resource sector is highly vulnerable to market volatility, and is not a stable source of employment relative to the opportunities that exist in other sectors. The report also states the manufacturing sector in 2008 was healthier than it was in 2002, referring to data which shows that research and development activities in manufacturing held constant over this period, while investment in information and communications technology grew.[93] Ending this analysis in 2008, however, is preemptive as the oilsands have continued to grow since then, and the Canadian dollar has largely maintained its high value.

A high dollar has strong reverberating and long-term effects that should be considered in any analysis of the impact of a booming resource sector on manufacturing. A recent report by the Mowat Centre uses data up until 2011 to clearly outline the longer-term relationship between the high dollar, falling exports, productivity and investment. The report observes that in Ontario, investment in the manufacturing sector has been declining sharply since the start of the dollar's rise in 2003, and notes, "This large decline in Ontario is driven by a weak demand for Canadian products due to the high Canadian dollar."[94] This decrease in investment directly translates into significant losses in productivity growth, which in turn harms long-term competitiveness. Whereas Ontario was enjoying strong productivity growth prior to 2003, since the loonie began to rise, average productivity growth has been almost zero.[95]

A second Spring 2013 report from the University of Calgary School of Public Policy aims to take a closer look at the impact of a high-valued loonie on Canadian manufacturers. Using calculations based on import and export sensitivities to the exchange rate, the paper argues the decline in manufacturing costs for firms in Ontario and Quebec may more than offset the revenue decline from decreased exports.[96] The authors state, "…the ultimate conclusion based on this analysis is that it is not clear (and perhaps even unlikely), that a high dollar is damaging to Canadian manufacturing, and by extension to Ontario and Quebec."[97] A 2013 report by the MLI presents a similar scenario, positing that the Canadian manufacturing industry has adjusted to the appreciating Canadian dollar by decreasing its reliance on export markets and increasing its use of imported inputs.[98]

Both the University of Calgary School of Public Policy paper and the MLI report fail to address the longer-term negative impact of export declines on capital investment and productivity. While manufacturers may encounter short-term savings from increasing their use of imported inputs, the Mowat Centre analysis finds that in Ontario, business investment is not currently replacing export losses.[99] This suggests there is cause for concern with respect to long-term viability of the manufacturing sector.

The assertion that the Canadian manufacturing sector has adjusted to the appreciating dollar is addressed in a 2013 study by the CCPA, which argues the MLI's position is a misinterpretation of the data. With regards to declining exports, the CCPA states, "…the decline in export intensity hardly implies that manufacturers have successfully adapted; rather, it merely indicates that after a decade of declining export sales (reflecting an erosion of relative competitiveness, as well as demand weakness in key export markets), Canadian markets now account for a larger share of remaining industry sales."[100] Likewise, the increase in imports is seen to be indicative of manufac-

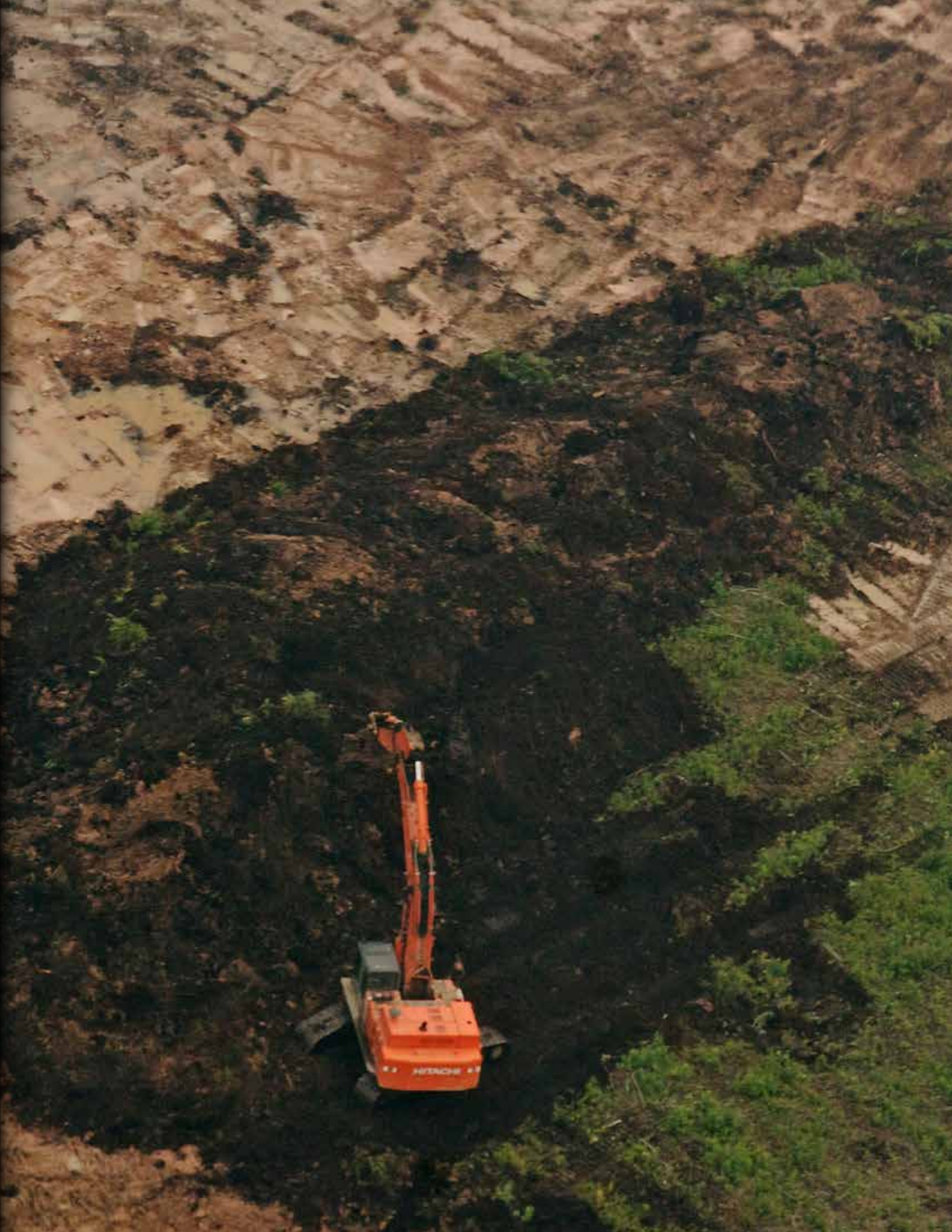
"Oilsands expansion exacerbates challenges currently being faced by the manufacturing sector, and could pose a significant risk to Canada's long-term economic competitiveness."

turing weakness, reflecting a decrease in input market competitiveness among Canadian manufacturers.[101] This only serves to perpetuate the domestic manufacturing challenge of declining demand; with a shift to relatively less-expensive imported inputs, demand for the products of Canadian firms that supply the same input will fall. This "trickle-down" consequence of the high dollar is already widely observed in the oilsands, with the Government of Alberta advertising that most of the trucks used in oilsands production are from Illinois, and much of the software to run production systems is from California's Silicon Valley.[102]

In its own evaluation of Dutch disease in Canada, the CCPA discusses three potential ways in which a resource boom can negatively impact other sectors of a country's economy — an increase in input costs and diversion of inputs from other productive industries, appreciation of the domestic currency which decreases the competitiveness of export industries, and a loss of the critical mass required for the development of non-resource industries, particularly innovation for new product areas.[103] The report finds all of these downfalls of a resource boom to be potentially relevant to Canada, and focuses primarily on what it terms to be Canada's "abysmal" productivity performance. It links this poor productivity performance back to Canada's low innovation effort, and outlines the risk Canada is taking by shifting its resources to an industry which is susceptible to poor productivity, which has displayed negative labour productivity growth over the last decade, and which has a relatively lower commitment to research and development.[104-105-106]

Compared to the Dutch experience in the 1970s, the current Canadian context is unique in many ways; therefore the simple diagnosis of Dutch disease fails to capture what is happening in the Canadian economy. Similarly, the research summarized above suggests that restructuring of global manufacturing away from advanced economies and towards lower-income countries like China is an equally unfitting diagnosis. As acknowledged by many of the new analyses, Canada's manufacturing sector is being impacted by a combination of these two factors. It is important to fully acknowledge and explore the implications of each of these factors. This includes evaluating the indirect and downstream consequences of a resource boom, ones that extend beyond the simple narrative of an appreciating currency that leads to a manufacturing sector decline.

As we previously concluded in our original report, *In the Shadow of the Boom*, Canada is undergoing changes, both positive and negative, that are unique to both the nature of its domestic economy, its regulatory framework, and Canada's role in a shifting global economy. The new analyses reinforce the uniqueness of Canada's economy, and the challenges of a resource boom. The result, consistent with our first conclusion, appears to be a uniquely Canadian strain of Dutch disease that we call "oilsands fever." In our view, "oilsands fever" is beginning to create clear winners and losers in Canada's economy. As will be explored in the upcoming chapters, oilsands expansion exacerbates challenges currently being faced by the manufacturing sector, and could pose a significant risk to Canada's long-term economic competitiveness.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5. The challenges and risks of a resource economy

5.1 Increasing disparities across industry sectors[107]

When an economy undergoes a shift (structural or otherwise), some sectors of the economy will be better off and some sectors of the economy will be worse off. When looked at in aggregate, Canada's economy has fared relatively well over the past decade. Between 2002 and 2012, overall GDP in Canada grew by an average of 1.9 per cent annually, with growth from 2011 to 2012 at 1.7 per cent.[108] This growth in overall GDP has in part been driven by the booming oilsands. While Statistics Canada does not track oilsands-specific GDP data, even with declining conventional oil and gas, the oil and gas sector grew by 3.2 per cent from 2011 to 2012.[109] However, not all sectors of the Canadian economy have fared as well as the oilsands.

The staples trap

Since 2002 there has been a remarkable increase in the real value of Canada's exports from the energy, metals and minerals, industrial and agricultural sectors, and a considerable drop in exports from the electronics, transportation, consumer goods and forestry sectors.[110] In 2002, just under 13 per cent of Canadian exports were energy products; in 2012 that proportion had grown to over 25 per cent of Canadian exports.[111]

As recently noted by the CCPA, Canada's increasing reliance on energy exports is demonstrative of a "staples trap." A staples trap exists when a country becomes increasingly reliant on a single resource. Its economy becomes less diversified, leading to increased pressure to expand production of the single resource, or to find a new staple to export. This consequence of the staples trap is apparent in Canada through expansion of the oilsands, and increasing attention to the potential for new energy products such as shale gas. Providing further evidence for a staples trap in Canada, from 1997 to 2012, oil's national share of commodity production value rose from 18 to 46 per cent, nearly as much as the economic value generated from natural gas, forestry, metals and mining, agriculture, and fishing combined.[112]

Part of the reason why non-commodity exports have been struggling is due to the "China syndrome" — the global shift of manufacturing to China. A 2007 Statistics Canada paper suggested that Canada was not, in fact, suffering from Dutch disease but had developed "China syndrome."[113] China syndrome is characterized by a structural shift away from manufacturing and towards the services sector, driven by increased supply of low-cost, non-durable manufactured products from China.[114] The paper noted that Canada's market integration with China has not only increased imports of Chinese-manufactured products into Canada but has also created increased global demand for commodity feedstocks.[115] As a result, the study suggested that China is driving an economic restructuring in Canada, with the textiles, clothing, forestry and automotive industries most impacted.[116]

Another reason why Canadian non-commodity exports are challenged is the U.S. recession of 2008–2009 and the subsequent stalled growth. The U.S. is Canada's largest trading partner, accounting for 73 per cent of Canada's exports in 2011.[117] As a result, any change in the economy of the U.S. has profound impacts on the Canadian economy. That said, the decline in manufacturing started well before the 2008–2009 recession in the United States.

The high-valued loonie is also a major reason why the Canadian manufacturing sector is continuing to contract. Comparing real manufacturing output from 2002 to 2011, the period over which the loonie experienced its largest gains, Canada experienced a decline in output of 11 per cent, while output in the U.S. grew by 23 per cent. [118]

Investment strategy and consulting firm Macro Research Board (MRB) has called the appreciating Canadian dollar a "severe drag on non-commodity exporters."[119] MRB believes the non-commodity export sector is no longer competitive and is rapidly losing market share.[120] A recent study by the IMF looks specifically at the causal effects contributing to the decline in Canadian manufacturing's U.S. market share from 2000 to 2011. It finds that 40 per cent of the decline is attributable to the increase in China's U.S. market share, and the remaining 60 per cent is explained by the appreciation of the Canadian dollar.[121]

Competitiveness

Attention is also being paid to Canada's declining competitiveness, and for good reason as illustrated by Figure 3. Non-commodity exporters have not been faring well, and are struggling to remain competitive in international markets.

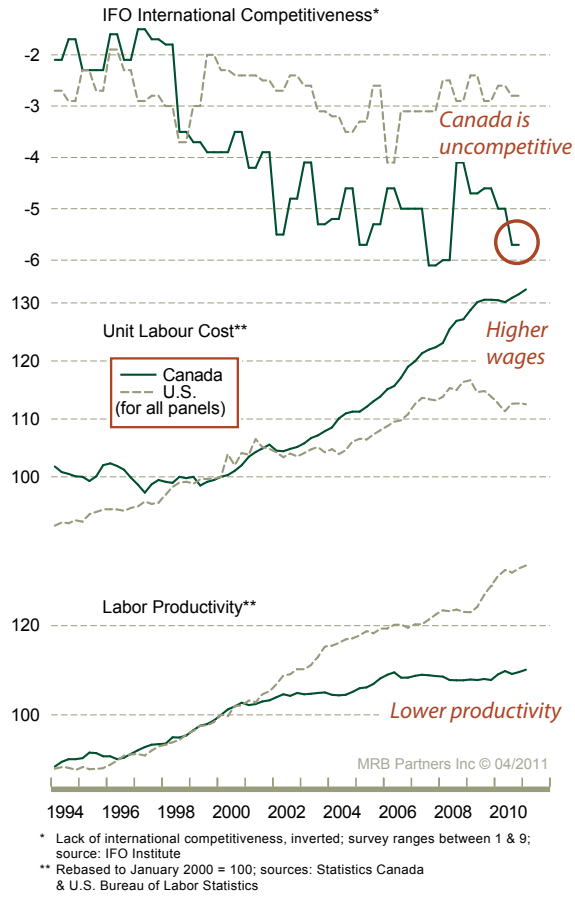


Figure 3. Trends in Canadian and U.S. international competitiveness, unit labour costs and labour productivity, 1994–2011
Source: MRB 2011[122]

One of the challenges underpinning this declining competiveness has been poor productivity performance. The Conference Board of Canada has found that Canada has a "dismal track record on productivity growth," especially compared to the U.S., our largest economic competitor.[123] Labour productivity, as noted in Figure 3, has been declining, and it has not been offset by investment in technology and equipment — even though the high-valued Canadian dollar should allow those kinds of investments to increase productivity and ultimately, competitiveness. As the University of Calgary School of Public Policy states, "That an increase in capital investment in manufacturing does not seem to have materialized is a cause for some concern."[124]

MRB suggests that the trend of deteriorating competitiveness is unlikely to be reversed given that businesses have been investing heavily in residential structures rather than machinery and equipment.[125] They also note that many manufacturing companies, especially in the hard-hit auto and consumer goods sectors, have retooled in order to serve the resource sector, further contributing to an economy that is increasingly unbalanced and reliant on commodities.[126] Overall, it is apparent that companies have not been investing in enhancing their productivity or reducing unit labour costs, and as a result it is likely that the non-resource sector will continue to suffer in the global marketplace.[127]

Jobs

When the oilsands are booming, it becomes more difficult for companies outside of the resource sector to attract workers. The high demand for skilled and unskilled labour in Alberta drives up wages. On average since 2008, the per capita income differential between Alberta and the rest of Canada has stood at over $12,000.[128] This high wage differential attracts new workers to Alberta, diminishing the labour supply in other provinces. Since 2002, Alberta is the only province to consistently record positive net interprovincial migration. In 2012, Alberta's net interprovincial migration was 45,718, and it was one of only two provinces to record positive interprovincial migration numbers. Saskatchewan, another resource rich province, came in a far-distant second with 2,647 incoming migrants.[129]

An increasing number of Ontarians, Quebeckers and Maritimers are relocating to Alberta to assume a job in the oilsands, propagating a phenomenon referred to as a labour re-allocation effect in those workers' home provinces.[130] Individual workers are attracted to Alberta by higher wages, but such a reallocation of labour is not efficient from the perspective of Canada as a whole. Rather, the economics literature predicts that when provinces collect resource rents there will be over-migration to resource rich regions, resulting in congestion.[131] While Canada's equalization program is designed to offset these effects, it is unable to fully prevent them, in part because it is financed by distortionary taxes and excludes a portion of natural resource revenues from its funding formula.

Changes in employment in Canada further demonstrate the downward trend in the manufacturing sector. Compared to other sectors in the economy (Graph A of Figure 4), employment in the manufacturing sector (Graph B of Figure 4) has not recovered from the 2008–09 recession.[132] Between 2004 and 2010, more than 550,000 jobs were lost in the manufacturing sector, representing 3.2 per cent of all employed Canadians.[133-134] A 2007 parliamentary report on manufacturing concluded that the major job losses in manufacturing were not in response to a cyclical downturn but rather to a large shift in Canada's economy; the share of labour-intensive manufacturing in overall employment

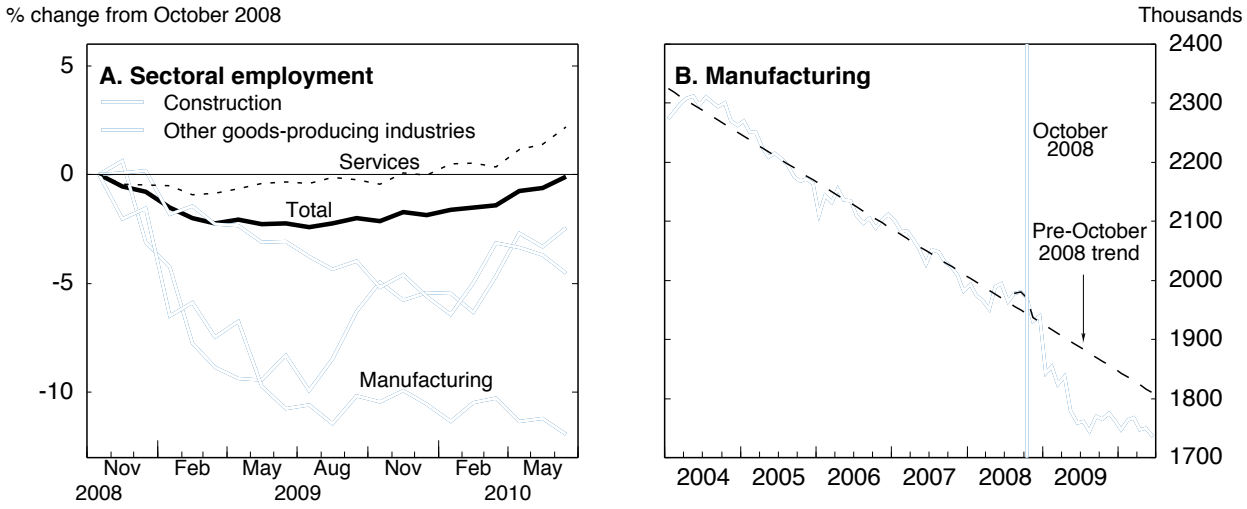


Figure 4. Changes in employment by sector
Source: OECD[135] (data from Statistics Canada)

is falling and the relative importance of the resource sector is rising.[136] Despite an oilsands boom, Alberta has also seen a decline in manufacturing jobs as a percentage of total employment, from nine per cent in 2002 to 6.5 per cent in 2012, a drop of more than 11,000 jobs.[137]

Looking strictly at job numbers, overall employment opportunities in Alberta have increased, with a large proportion of these new jobs coming from the resource sector. It is important to acknowledge, however, that the resource sector is particularly vulnerable to market volatility, and relative to the manufacturing sector, is a less stable source of long-term employment.

The rise of the resource sector over the past decade, and in particular the oilsands, is contributing to a re-orientation of Canada's economy. While there are certainly other factors at play — most notably the rise of low-cost manufacturing centres and the U.S. recession — it is also the case that the oilsands are becoming an increasingly important export for Canada, are attracting an increasing share of the labour force, and are adding to the competitive and productive challenges facing Canada's manufacturers. The following section will explore how these changes are playing out geographically across Canada.

5.2 Increasing disparities across regions

In 2008, the OECD noted that oilsands development is "generating large regional disparities, especially because some provinces are affected by negative externalities through the currency appreciation and have questioned the appropriateness of current inter-provincial redistribution mechanisms."[138] It is apparent that the economic impacts of oilsands development, both positive and negative, continue to strain relationships between provinces.

As was explored in section 5.1, manufacturing sectors are struggling to compete and continuing to decline, while the oilsands and other resource sectors boom. On the ground, this dichotomy is playing out along provincial boundaries. For example, the manufacturing-heavy pro-

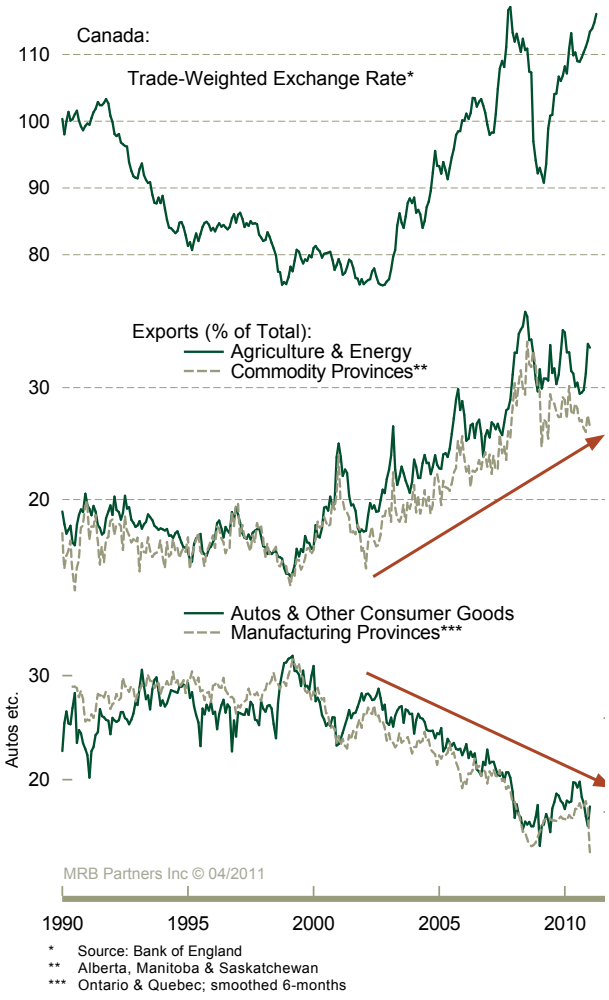


Figure 5. Trends in sectoral and provincial exports, 1990–2010
Source: MRB[139]

vinces of Quebec and Ontario have fared worse than other regions in Canada.[140] Looking at real GDP growth between 2000 and 2012, Ontario and Quebec (at 19 and 20 per cent, respectively) lagged behind the rest of the nation. Meanwhile, Newfoundland and Labrador, Alberta and British Columbia all led the provinces with over 30 per cent growth during the same period.[141]

As a measure of economic performance by sector and province, it is illustrative to look at the breakdown of exports (Figure 5). When the percentage of total exports from agriculture and energy are compared with the percentage of total exports from automobiles and other consumer goods, and this is overlaid with the percentage of exports coming from commodity provinces (Alberta, Manitoba and Saskatchewan) and from manufacturing provinces (Ontario and Quebec), the growing regional disparity in exports across provinces in Canada is readily apparent.[142] Clearly the ascendant western or commodity provinces are increasing their dominance of Canada's export market and outperforming exports from the traditionally strong manufacturing base in central Canada.[143] A more detailed look at the changing economic landscape in Quebec, which has seen both its manufacturing sector and its share of Canadian exports decline over the past decade, is provided in Box 5.2-1.

While there are economic benefits from the oilsands flowing out of Alberta, the reality is that from the perspective of GDP and employment, Alberta is the biggest winner. Keeping in mind the assumptions of input-output modelling discussed in Chapter 2, the CERI report on the expected economic impacts of oilsands development estimates that Alberta will realize 95 per cent of the GDP benefit associated with oilsands investment and operations, and 86 per cent of new employment opportunities.[144] The Conference Board of Canada report on the impacts of oilsands investment finds that Alberta will realize 74 per cent of new employment opportunities.[145] These results, along with the distribution of economic impacts outside of Alberta, are shown in Figure 6.

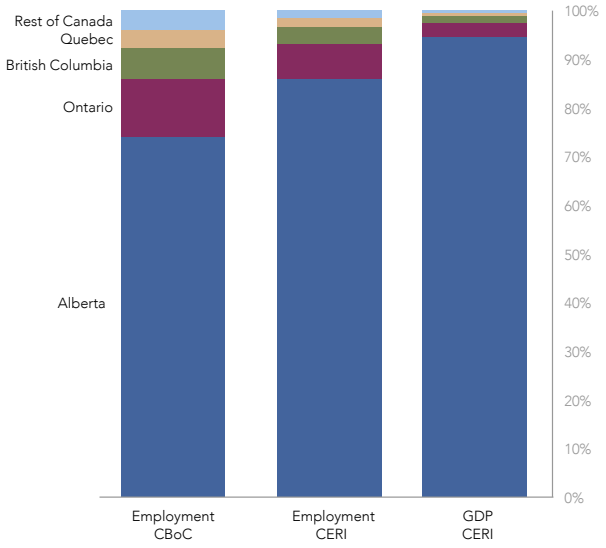


Figure 6. Estimates of the national distribution of economic benefits of the oilsands
Data source: CERI[146], Conference Board of Canada[147]

Both reports find that outside of Alberta, the economic benefits of the oilsands flow mostly to Ontario, followed by British Columbia, Quebec, and then the rest of Canada. The Conference Board of Canada identifies manufacturing, transportation, and administrative, scientific and computer services as the main sectors outside of Alberta that are benefitting from downstream oilsands supply chain effects.[148] While downstream supply chain effects are limited, they still present cause for caution, particularly in the manufacturing sector. As documented in previous sections, Canadian manufacturers have struggled to compete in international markets in recent years. As international sales fall, some manufacturers are re-orientating their businesses to instead serve the oilsands.[149] Long-term, consistent demand from the oilsands, however, is far from guaranteed.

As will be explored further in upcoming sections, the oilsands industry is inherently volatile with a future development path, and thereby future demand for inputs, that is dependent on many unknowns. In addition, even within Canada, a persistently high Canadian dollar makes domestic suppliers seem more expensive relative to their foreign competitors. The CERI report finds that oilsands investment and operations will result in significant economic benefits in the U.S., generating 2.2 times more in GDP contributions, and 1.8 times more employment opportunities, than what occurs in all provinces other than Alberta.[150] The Conference Board of Canada also finds the rest of the world stands to gain significantly from oilsands investment. International countries are expected to receive 27 per cent of supply chain employment effects, compared to almost 54 per cent for Alberta, and only 19 per cent for all other Canadian provinces.[151]

In its 2008 economic survey of Canada, the OECD paid special attention to the increasing importance of resources, in particular energy, in the Canadian economy. The report noted, "Canada confronts the challenge of a natural-resource shock having highly asymmetric impacts across the federation," which it identified as having "…profound effects on relative revenue-raising capacities of different provinces, stretching the capabilities of the equalisation system" and creating an "unprecedented source of imbalance in the Canadian federation."[152] In other words, the uneven distribution of natural resources across the country has a direct and dramatic effect on the relative wealth of each region.

The OECD also noted that corporate tax preferences

Box 5.2-1

Quebec's changing economy

Quebec has always had a strong manufacturing base, which has played an important role in the economies of both Quebec and Canada. In 2000, Quebec's manufacturing sector GDP was valued at $57.8 billion, comprising 23.0 per cent of Quebec's total GDP.[153] Considered in a national context, Quebec's manufacturing sector GDP contributed 4.9 per cent to total national GDP. In the national export market, Quebec's manufacturing sector accounted for 11.4 per cent of total national exports.[154-155]

Since 2000, Canada's economy has been undergoing a significant restructuring. Oilsands production has drastically increased, the Canadian dollar has rapidly appreciated, and the makeup of Quebec's economy, and its role in the broader Canadian economy, has started to change. In 2012, Quebec's manufacturing GDP had fallen to $42.9 billion, a 25.9 per cent decline.[156] Across the nation, this decline was second only to Ontario, which saw its manufacturing sector contract by 32.5 per cent.[157]

While still the largest industry in Quebec, manufacturing now represents a notably smaller 14.1 per cent of total Quebec GDP.[158] Despite some recent efforts by the provincial government to foster the development of an emerging clean-tech sector, losses from the manufacturing sector were widely spread out. As a share of total Quebec GDP, most other industries experienced modest gains of less than two per cent.[159] Nationally, Quebec's manufacturing sector now contributes 2.8 per cent to Canadian GDP, over a 40 per cent decline in national share since 2000.[160] There has been a similar contraction in the export market, where Quebec manufacturing exports have declined by 42.0 per cent since 2000, and now account for 7.6 per cent of national exports, over one-third less than in 2000.[161]

Similar to the rest of Canada, exhaustible resource extraction is easily the fastest growing industry in Quebec, increasing by 122.8 per cent from 2000 to 2012.[162] At 1.2 per cent of Quebec GDP in 2012, however, it represents only a very small portion of output in the Quebec economy.[163] It should also be noted that certain forms of resource extraction, such as shale gas, are being met with strong public opposition. The provincial government has responded by putting in place a moratorium on the exploration and exploitation of shale gas in the province. There is also an emerging debate over the proposed intention of the government to allow shale oil exploration, and ultimately exploitation, in the province.

to the resource sector led to an additional, artificial boost to the natural advantage of resource-rich regions.[164] In addition to these generous tax write-offs, provincial resource royalties are deducted from the federal corporate tax base, thus reducing the amount of federal income tax that corporations must pay.[165] Provincial resource royalties stem from Canada's constitution, which assigns resource ownership to the provinces. This historical assignment of property rights is now having the inadvertent impact of accentuating regional inequities, with national taxpayers bearing part of the burden of provincial royalty payments.

New pipelines are often put forward as nation-building projects for Canada.[166] The claim is that expanding transportation networks that open new markets will relax current capacity constraints in the oilsands. This will allow for continued development, which will bring rewards to all of Canada. The reality is that oilsands development is creating significant regional imbalances with respect to GDP growth, employment and tax revenue. The majority of the economic and employment benefits from expansion occur in Alberta, while many of the benefits that could flow to other Canadian provinces end up in the U.S. and overseas as oilsands producers seek to minimize costs.

Furthermore, what is flowing to other Canadian provinces are the risks posed by oil transportation infrastructure running through their communities. An international pipeline expert recently found that a high risk of rupture would accompany reversal of the Line 9 pipeline, and that the leak detection systems and emergency response plans along much of the pipeline are inadequate.[167] These findings led energy economics experts to conclude that implementation of the Line 9 reversal would present substantial economic, environmental and health risks, and that the potential economic costs of the project could exceed the anticipated benefits.[168] The risk/reward tradeoff from expanding infrastructure and oilsands development is arguably unbalanced in many Canadian provinces — the rewards are limited and uncertain, while the environmental and health risks are significant and real.

Alberta's advantage is making it more difficult for other regions in Canada to cope with the larger shift happening in the national economy. In spite of its advantage, however, Alberta must also deal with its own unique set of challenges that are arising as a result of oilsands development. These are briefly explored in Box 5.2-2.

5.3 The revenue gamble

The price of oil is known to fluctuate significantly and unpredictably over time — as illustrated in Figure 2 (Chapter 3).[169] For a petro-currency, oil price volatility will lead to exchange rate and revenue volatility — a challenge for both businesses and governments attempting to plan and make important decisions.

Looking at the data of Alberta's economic performance over the past decade, the roller-coaster ride associated with economic reliance on oil and gas is made starkly apparent. Compared to all other provinces, in the last 10 years Alberta has experienced the greatest volatility in percentage change in GDP. According to an analysis by the C.D. Howe Institute, the volatility of Alberta's government revenues was twice that of B.C., Saskatchewan or Ontario. However, when resource revenue is excluded from revenue calculations, Alberta's income is no more volatile than that of other provinces — a clear indication that Alberta's revenue volatility comes from its oil and gas revenue.[170]

Alberta's overreliance on oil and gas revenues was made painfully clear in its 2013 budget, when it announced that it will receive $6.2 billion less in resource revenues than anticipated by the 2012 budget forecast — forcing the province to roll out an austerity budget amidst record high levels of bitumen production.[171] This decrease in revenues was largely attributed to what Premier Alison Redford termed the "bitumen bubble," the differential between the North American price of oil (WTI) and the Alberta price (Western Canada Select (WCS)), which increased sharply towards the end of 2012.[172]

Perhaps equally as concerning as the bitumen bubble is that Alberta arguably set itself up for its current shortfall through an aggressive price forecast for oil in its 2012 budget. While Premier Redford's address on the bitumen bubble presented the province's 2012 oil price forecast as conservative, the reality is that it exceeded market expectations. As acknowledged by the Government of Alberta when it released its 2012 budget, "The forecast increase in (oil) price is slightly less than the average of confidential private sector forecasts provided to the government and higher than that of the average of all private forecasters, which is brought down by some forecasters who have not factored in continued growth in global demand."[173] Recognizing the Government of Alberta's overly optimistic forecasting, University of Alberta economist Andrew Leach predicted in February 2012 that if the market was correct about future oil prices, then the province would face a $2–3 billion discrepancy in realized versus predicted revenues.[174]

The government's difficulty in accurately forecasting oil revenues makes long-term economic planning a challenge. Alberta and Saskatchewan, the two provinces in Canada most reliant on energy revenues, are also the two provinces with the poorest track record of meeting budget targets.[175]

While Alberta's experience on the revenue roller-coaster should serve as a cautionary tale, the federal government remains seemingly ignorant of the extent to which the rise and fall of oil prices will increasingly affect its revenues in the future. While Alberta wants off this revenue roller-coaster, it seems the federal government is

Box 5.2-2

The Alberta advantage?

With the vast majority of the economic benefits from oilsands development being realized in Alberta, it is easy to dismiss the notion that the economic downsides may extend to Alberta as well. This dismissal would be a mistake. Rapid oilsands development is placing increasing pressure on Alberta's markets, infrastructure, and social services, and is creating a wide-ranging set of challenges unique to Alberta.

In April 2013, the Parkland Institute at the University of Alberta issued a report, *Taking the Reins: The Case for Slowing Alberta's Bitumen Production*, in which they outline many of the social and economic downsides resulting from Alberta's current pace of oilsands development. These include: a high rate of inflation which translates into a high cost of living; high population growth putting pressure on public infrastructure, social services and housing availability; a scarcity of materials and labour leading to resource shortages in many sectors; compromised education and training programs due to the high pressure to graduate workers; high school graduation rates below Canada's national average; and workplace fatalities well above Canada's national average.[176]

The oilsands industry, and its workers, are not spared from these downsides. Rather, many of these effects are felt most acutely in Fort McMurray and surrounding areas. In June 2013, the average price of a single family home in Fort McMurray was $784,961, well exceeding the average prices in Calgary and Edmonton of $527,429 and $417,836 respectively.[177-178-179] On the industry side, per barrel production costs grew by 13.2 per cent for an oilsands mine and 6.4 per cent for an in situ oilsands plant over the past year.[180] These rising costs continue to push up the break-even price for extraction, and increase the risk of new projects.[181-182]

eagerly waiting next in line for the ride. In fact, federal Natural Resources Minister Joe Oliver praised Alberta's economic model in January 2012, stating, "Today, energy accounts for one quarter of Alberta's GDP, nearly 70 per cent of Alberta's exports and 35 per cent of Alberta Government revenues. I think we can agree that's good news, and I can assure you our government wants Albertans and all Canadians to continue to hear that kind of news."[183]

It's rare to hear a speech by federal cabinet ministers supporting the oilsands in which they fail to note the importance of future public revenues from oilsands development. As recently stated by Federal Treasury Board President Tony Clement when promoting the Energy East pipeline to the Charlottetown Chamber of Commerce, "If we want health care in the future, if we want to be able to pay for our schools and educating our kids, we need these resources to be out of the ground."[184]

Corporate tax revenues paid to the federal government currently account for only a small portion of federal government revenue. As Clement's remarks indicate, however, the federal government is looking towards the future. A current estimate suggests the oilsands will generate $322 billion in federal government tax revenues over the next 25 years.[185] On an annual basis, this works out to the oilsands supporting approximately five per cent of total federal revenues.[186] This estimate makes clear that the contribution of oilsands to federal government revenues is rising. As it rises, the federal government's vulnerability to the volatile nature of the global oil market will also become more pronounced.

5.4 The carbon gamble

While the Canadian economy, and public revenues, will be subject to the challenges and changes driven by volatile oil prices, there are also longer-term and much more fundamental challenges ahead. Numerous energy sector observers and analysts have begun to identify the disadvantages of continued global reliance on oil, especially from sources like high-carbon oilsands.

A 2009 report by multi-national management consultancy Arthur D. Little (ADL) concluded that "…we may be closer than most people currently believe to a 'tipping point' which would see long-term downward pressure on the demand for oil and oil products. In this scenario, seen as the antithesis to the 'peak oil' argument, we could see oil demand peaking before oil supply does."[187]

Along a similar theme, the Alberta Premier's Council on Economic Strategy warns that, "…we must plan for the eventuality that oilsands production will almost certainly be displaced at some point in the future by lower-cost and/or lower-emission alternatives. We may have heavy oil to sell, but few or no profitable markets wishing to buy."[188]

The CCPA presents a similar caution, noting that "…staples-driven booms can end as quickly and dramatically as they begin." While acknowledging the possibility for the end of the resource boom to be driven by supply side factors, the CCPA states the more likely determinant to be a reduction in demand, specifically, "…the erosion of markets for carbon-polluting fuels like bitumen as a result of global measures to address climate change."[189]

Consistent in all of these assessments is the understanding that action to address climate change will necessitate, and therefore drive, significant changes in the way in which the world produces and consumes energy, especially oil. Many of the world's proven fossil fuel reserves are now being called "unburnable carbon," a name that recognizes that due to climate implications, these reserves cannot be safely extracted and consumed.[190] This has significant financial market implications, which has led to another new term — the "carbon bubble."[191] The risk facing the financial market is that current energy company valuations are backed by proven reserves. These valuations will drop sharply with a fall in global fossil fuel demand.

So what would this mean for Canada, and the relatively carbon-intensive Canadian oilsands?

The market capitalization of fossil fuel companies on the Toronto Stock Exchange stood at over $379 billion at the end of 2011. If the carbon bubble bursts then this will have detrimental effects on the stock market. Particularly at risk are Canadian pension funds and other forms of invested capital.[192] Canada is arguably particularly vulnerable to the carbon bubble since, relative to other global fossil fuel reserves, oilsands are among the most carbon intensive and the most costly to produce. As a result, if global oil demand wanes and prices begin to fall then continued development of the oilsands will likely be at greatest risk.[193]

In its 2010 World Energy Outlook, the International Energy Agency modelled a "450 Scenario" to project energy supply and demand that would be consistent with stabilizing atmospheric greenhouse gas concentrations at 450 ppm of CO_2 equivalent (a concentration scientists suggest offers a 50 per cent chance of limiting warming to two degrees Celsius). Not surprisingly, this science-driven scenario would have significant implications for Canada's oilsands sector. Assuming wide-scale use of carbon capture and storage (CCS), the 450 Scenario projects that oilsands production would continue to grow, with production reaching 3.3 million barrels per day in 2035.[194] This is a far-reaching assumption, however, with estimates of the cost of CCS technology ranging from $95–$225 per tonne of CO_2.[195] This far exceeds both the current $15 per tonne carbon price in Alberta, as well as the price of $40 that is currently being proposed in Alberta's 40/40 plan.[196]

Temporarily disregarding the high costs of CCS and

letting the assumption of widespread CCS adoption stand, under the 450 scenario Canada's oilsands industry would continue to operate while the country contributes its share of global emissions reductions required to meet international climate targets — but oilsands production would occur at a rate far below current projections, and most likely with lower revenues. The Canadian oilsands sector currently anticipates reaching 3.2 million barrels per day by 2020,[197] nearly 15 years earlier than the IEA predictions, with a future proposed rate of over 9.7 million barrels per day, but those growth rates do not take our climate commitments into account.[198]

It's noteworthy, then, that the federal government has committed to the Copenhagen Accord,[199] which sets a goal of limiting the long-term average increase in the global temperature to two degrees Celsius above pre-industrial levels — which, as noted above, requires stabilizing the concentration of greenhouse gases in the atmosphere at a level no higher than 450 ppm CO_2eq.[200]

But even as it made these commitments, the federal government has been tempering ambitions and expectations about how it will manage greenhouse gases, in part because of the potential implications for the development of the oilsands. The Government of Canada has never demonstrated how it plans to both deliver on its international commitments to reduce greenhouse gases and realize its aspirations for unconstrained growth in the oilsands sector. Relative to 2005 levels, oilsands expansion is expected to add 72 Mt of carbon to the atmosphere by 2020, more than cancelling out the 67 Mt of reductions that are expected in Canada's other industry sectors. In this scenario, Canada will achieve only 50 per cent of its 2020 climate target, which is a reduction of emissions to 17 per cent below the 2005 level by 2020.[201-202] Perhaps it should then be of little surprise that the federal government continues to delay its promised regulations to reduce greenhouse gas pollution from the oil and gas sector. The regulations were initially promised in June 2011, and expected by the end of 2012. They were subsequently delayed to mid-year 2013; that deadline has since come and gone without any firm indication of when the regulations might arrive.[203]

Despite regulatory delays on the part of both provincial and federal governments, an increasing number of oil companies are advocating for a price on carbon and introducing "shadow" carbon pricing to inform investment decisions.[204-205-206] Oil and gas companies are also showing initiative through investment in renewable energy technology and products. For example from 2000 to 2010, U.S.-based oil and gas companies invested a total of approximately $9 billion in renewable energy.[207]

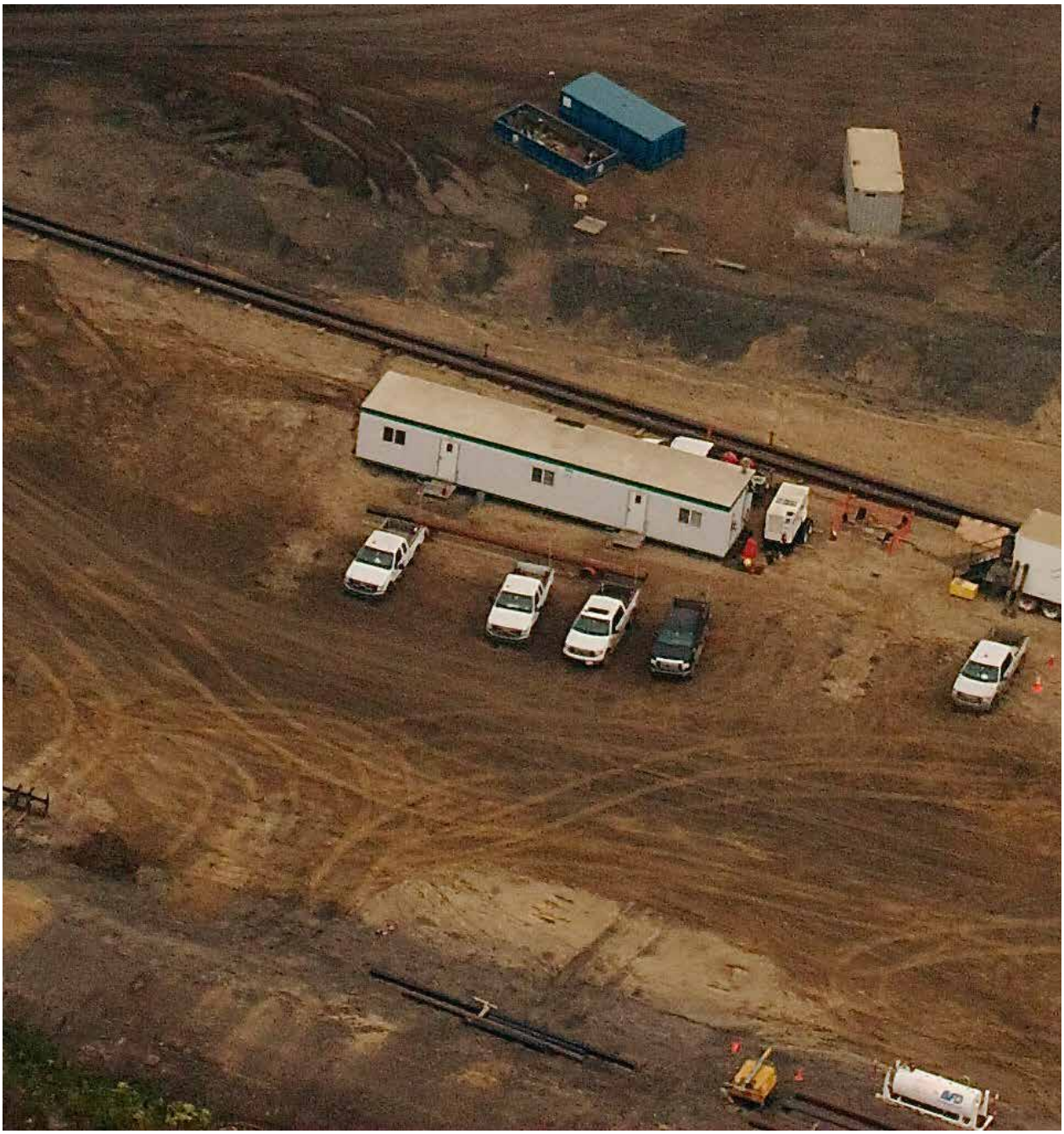
The government's lack of action fails to acknowledge the shift towards low-carbon energy alternatives that is occurring in countries around the world. Global investment in renewable energy was $244 billion in 2012, the second highest year of investment on record and down only slightly from its all-time maximum of $279 billion in 2011.[208] Globally from 2011 to 2012, renewable energy capacity increased by 115 GW, representing just over half of total net additions to global electric capacity.[209] While Canada has established a renewable energy presence in hydro and wind generation, there remain significant market diversification opportunities, including clean energy manufacturing and exports, that the government is not currently taking advantage of.

Canada's lack of action on climate change contrasts starkly with efforts in the United States. In his June 2013 speech on climate change, U.S. President Barack Obama outlined the steps the United States is taking to reduce carbon emissions, and stated that Keystone XL would only be approved if it "does not significantly exacerbate the problem of carbon pollution."[210] He has since commented on Canada's performance directly, stating that the Canadian government could be doing more to mitigate carbon emissions in the oilsands.[211] On the clean energy front, the U.S. government has established a Clean Energy Manufacturing Initiative within the Department of Energy. The objective of the initiative is to ensure that United States manufacturers are in a position to be competitive in the production of global clean energy products, and to increase competitiveness in all manufacturing sectors by increasing energy productivity.[212]

While the United States is acknowledging the changing global energy landscape, and moving forward, Canada is stalled. Increasingly it appears the federal government is betting that the world will not take science-based action to address climate change. It assumes that the global demand for fossil fuel-based energy will remain high — but as explained above, this bet is quite risky, and unlikely to pay off.

While much of the debate surrounding future oilsands development, Dutch disease and regional economic fortunes to date has focused on the recent economic performance of different sectors, the longer-term consequences of this restructuring should be of equal or even greater concern to Canadians. As stated in a recent report by the CCPA, Canada is at risk of being caught in a staples trap that is evolving into a carbon trap as well.[213] The Canadian economy is becoming increasingly reliant on the oilsands industry, locking Canadians into a high-carbon intensity development path. This path potentially sacrifices the innovative benefits that come from a more diversified economy, and also limits Canada's ability to transition to a low-carbon economy.

Accelerating the development of the oilsands regardless of economic, social or environmental cost would only serve to increase the near-term economic downsides



of oilsands across the country, and the associated regional tension. What is needed, given this context, is government leadership to assess and understand the challenges and choices at hand, and to dispatch public policy tools to mitigate the short-term impacts of oilsands development while facilitating the longer-term transformation of our economy to ensure its competitiveness in a carbon-constrained future. The Pembina Institute's 2013 report *Competing in Clean Energy: Capitalizing on Canadian innovation in a $3 trillion economy* identifies three opportunities for the federal government to better support clean energy entrepreneurship in Canada. Specifically, the report recommends developing a set of federal financial tools, including green bonds, and recapitalizing Sustainable Development Technology Canada; developing a national energy strategy that leverages the value of fossil fuel resources to support clean energy development, deployment and export; and ensuring firms fully internalize the cost of fossil fuel energy by accelerating the phase-out of fossil fuel subsidies and establishing a national carbon price.[214-215]

6. Conclusion and recommendations

Canadians deserve an informed, inclusive discussion and debate about the future of our economy. While Canada appears blessed with an abundance of energy resources, how we manage the development of these resources — environmentally and economically — has ramifications that will affect current and future generations.

Canada's economy is shifting to an increasing reliance on commodity production, with the production value of oil growing at the fastest rate.[216] This is being reflected in the value of the dollar, which began a rapid rise in 2002, and has been hovering close to par with the U.S. dollar for the past 2.5 years. Numerous analyses have shown that increasing oil prices have contributed to this rise, resulting in what some believe is an over-valued loonie.[217-218] The high Canadian dollar is having a negative impact on Canada's export competitiveness, compounding challenges Canada's manufacturing sector already faces in a global economic restructuring.

Numerous developing and industrial countries are also driving a global energy restructuring through the adoption of policies to address climate change. Much of the world's fossil fuel reserves are being labeled as unburnable carbon. As a high-cost and carbon-intensive fossil fuel source, Canada's oilsands are at risk of being among the first to go if global oil demand and prices begin to fall.[219] As it attempts to drum up national support for new pipeline development, the federal government is quick to point out the importance of future public revenues from oilsands development. It would be better served by considering the reality that with a global shift towards low-carbon energy alternatives, future public revenues from oilsands will likely be volatile and uncertain. The federal government also needs to recognize that its current commitment to high-intensity carbon development is sacrificing significant opportunities in the clean energy sector, and putting at risk Canada's long-term economic competitiveness.

The following suggestions outline a path for near-term action to address the economic downsides of oilsands development currently being observed, while also informing the vision and leadership necessary to navigate Canada towards a sustainable energy future.

1. **Improve how the provincial and federal government manage one-time resource wealth.**

   The Government of Alberta and the federal government are direct beneficiaries of the economic growth associated with oilsands development — the Government of Alberta primarily through resource royalties, and the federal government primarily through corporate taxes. Historically, the prevailing attitude in Canada is that these resource revenues should not be treated any differently than other income.[220] Such an attitude shows a lack of understanding and foresight. Resource revenues are fundamentally different from other forms of revenue in that they represent one-time wealth, and they are exposed to the volatility of the global oil marketplace and its cyclical booms and busts. As former federal cabinet minister David Emerson has noted, "Energy and natural resource markets are notoriously volatile. The more government spending relies on such revenues, the more fiscal volatility and instability becomes embedded in fiscal frameworks."[221]

   Along with a number of organizations from across the political spectrum — the OECD, the Canada International Council, the Canadian Centre for Policy Alternatives, and the Institute for Research on Public Policy — we have previously recommended the federal government better manage one-time resource wealth by establishing a federal savings fund.[222-223-224-225-226] While we still believe the federal government should consider this option, we recognize there are challenges associated with establishing such a fund at the federal level. In Alberta, a resource savings fund already exists — the Alberta Heritage Savings Trust. Established in 1976, it currently stands at only $16.6 billion.[227] Alaska established a similar fund in the same year as Alberta. It currently stands at US$46.7 billion, almost three times the value of Alberta's fund.[228] Norway was a relative latecomer, establishing its fund in 1990 and making its initial deposit in 1996.[229] It has been diligent with its deposits since then, and the fund currently contains more than US$735 billion.[230] The Alberta government should be following the examples of other jurisdictions with a high reliance on non-re-

newable resource revenues: it should be doing more to grow its long-term resource fund, rather than using its current resource wealth to maintain lower tax rates.[231]

Resource revenues at the provincial and federal level that are not saved in funds should instead be used for capital investment; an alternative form of savings that will ensure future generations are benefitting from the one-time wealth of resource extraction. Targeted appropriately, using resource revenues for capital investment can also support sectors that may be at a disadvantage as a result of a resource boom.[232]

Lastly, capital investments at both the federal and provincial level should be made with the recognition that future sustainability requires a decreased dependence on fossil fuels. Investments should support clean energy technology development and deployment, and provide opportunities for workforce transition towards this growing sector. At the federal level, we recognize the government's significant commitments to infrastructure development, including green infrastructure. We encourage the government to expand this support by dedicating a specific portion of corporate taxes from the oil and gas sector towards the expansion of green infrastructure in Canada.

2. **Consider a full set of costs and benefits of rapid oilsands development in project review and approval processes.**

Oilsands development — by way of new project approvals or expansions to existing facilities — is governed by legislation at both the provincial and federal level. Depending on the size and scope of a project, it requires approval either by the Alberta Energy Regulator (AER) or a joint review panel, representing both the AER and the Canadian Environmental Assessment Agency (CEAA). The joint review panel is triggered for larger developments with projected environmental impacts that fall under the jurisdiction of the CEAA. These bodies weigh the localized social and economic effects of resource development against the project's anticipated environmental impacts. Using a "public in-

terest" criterion, their objective is to determine whether the project results in a net benefit to the public.

The CEAA administers the Canadian Environmental Assessment Act. Part of the purpose of the act is "to encourage federal authorities to take actions that promote sustainable development in order to achieve or maintain a healthy environment and a healthy economy."[233] In its current form, the regulatory process falls short in meeting the latter half of this purpose. It fails to take into account the full list of economic impacts of rapid oilsands development, many of which are downsides (direct and indirect) that are felt locally, provincially, and nationally. As was observed with the approval granted to Shell's Jackpine mine expansion by the joint review panel this past summer, direct economic benefits of a project are currently accepted without consideration of negative economic impacts. Despite acknowledging the mine expansion would result in significant, negative environmental and cumulative impacts, the joint review panel used only positive short-term economic impacts of the project — primarily jobs, taxes, and royalties — to rationalize its approval and did not consider negative economic consequences.[234]

It is worth noting the economic costs of rapid development extend to industry as well. When economic activity is high, high oil prices can lead to input shortages (and subsequently higher costs), regulatory bottlenecks, and technology lock-in. From the perspective of the Government of Alberta, the federal government, and all Canadians, high input costs have the additional effect of reducing oilsands royalties and corporate income taxes, which are paid on a net revenue basis.[235] When oil prices are low there is a risk of large revenue losses and rapid worker layoffs. From society's perspective, a rapid slowdown in business activity can also elicit an inefficient and costly regulatory response.

Alternatively, a regulatory process that moderates industry growth presents significant economic benefits. Input markets are less competitive, and companies are better positioned to take advantage of various cost-saving measures. These can include adopting new technologies, and identifying and exploiting project efficiencies and synergies.

A true test of public interest requires that the review process, whether conducted solely by the AER or by a joint review panel, take a more thorough approach to evaluating the impacts of a project. The scope of the public interest test should be expanded to include a full cost-benefit analysis that considers the short-term and long-term economic and environmental implications of rapid oilsands development at the local, provincial, and national level. This includes conducting non-market valuations of expected environmental damages, evaluating the economic costs and risks of rapidly developing a resource with high price volatility, and looking at the economic benefits of a more moderated approach to development.

3. **Initiate a federal committee study on maintaining economic competitiveness with a high and volatile Canadian dollar.**

   Over the past 10 years, the Canadian dollar has dramatically appreciated and increased in its volatility. This is due to many reasons, including stalled growth in the United States, the rising price of oil, and increased foreign investment in Canada. As this report has highlighted, a high and volatile dollar can have negative implications for many private sector industries.

   In response to the highly appreciated Canadian dollar, the Conference Board of Canada advised first and foremost that a "do nothing approach is not a viable option."[236] Various academics and organizations have suggested solutions to the high dollar — from Bank of Canada interventions to lower the exchange rate, to the establishment of Sector Development Councils, to more aggressive research and development investment subsidies and tax credits to support enhanced manufacturing productivity.[237-238-239] So far the federal government has given little consideration to the challenges of a high dollar, let alone possible solutions such as those listed above.

   The House of Commons Standing Committee on Industry, Science and Technology is well positioned to undertake a study on economic competitiveness and the high dollar.[240] The study should look at trends in the restructuring of the Canadian economy and associated regional disparities, and aim to identify actions that the federal government can take to ensure a robust, diverse economy that supports economic growth and competitiveness across Canada.

4. **Transition to low-carbon industries throughout Canada.**

   As the global clean technology industry grows to a projected $3 trillion by 2020, Canadian clean technology companies have the potential to increase their market share from today's $9 billion to $60 billion.[241] If Canada is to compete in this burgeoning global low-carbon economy, the federal government should play a key role in using energy and environmental policy to position its economy for long-term success.

These policies can also be tailored to support development across the country, addressing some of the emerging regional economic divisions and ensuring that provinces have an equivalent chance for success.

There are many ways in which the federal government can demonstrate policy leadership in this arena.

(i) Eliminate preferential tax treatment for the oil and gas sector

Both the OECD and International Energy Agency have repeatedly recommended that countries remove inefficient fossil fuel subsidies.[242] In 2009 the G20 countries, including Canada, agreed to phase out fossil fuel subsidies over the medium term.[243]

Canada has made only limited progress towards this commitment. It has phased out a number of smaller programs, including all those specific to the oilsands, but the largest fossil fuel subsidy program — the Canadian Development Expense, which resulted in an estimated $478 million in foregone federal tax revenue in 2009 — still remains.[244-245] Distortionary fossil fuel subsidies are accelerating high-carbon fossil fuel development, and also making it more difficult for low-carbon energy sources to be competitive.

Given that this tax treatment is unnecessary and contributes to detrimental side effects, we suggest that the federal government develop and implement a plan to phase out such treatment.

(ii) Introduce federal oil and gas regulations that put Canada on track to meet its 2020 emission reduction target

In 2005, Canada committed to reducing its carbon emissions by 17 per cent of 2005 levels by 2020. From both an economic and environmental perspective, we believe the preferred policy tool for achieving Canada's 2020 target is a robust economy-wide carbon price. The federal government, however, has chosen to achieve this target through the implementation of "sector-by-sector" regulations. We focus this recommendation therefore on informing the regulations for the oil and gas sector — regulations that as of early November 2013 have not been released, despite a deadline of July 1.

In spring 2013, the Pembina Institute released a report, *Getting on Track to 2020: Recommendations on greenhouse gas regulations in Canada's oil and gas sector*, which outlines what the federal oil and gas regulations will need to look like in order for Canada to meet its 2020 emission reduction target. The report estimates the oil and gas sector will have to reduce its emissions by 42 per cent relative to its projected 2020 emission level.[246] The report offers numerous recommendations for achieving these reductions, which we endorse here.

First, any regulations should cover both combustion and non-combustion emissions that can be accurately measured, they should apply to both new and existing facilities, and they should send a clear signal that their stringency will increase after 2020.[247]

Second, there is some indication that the federal government is planning to adopt regulations modelled on Alberta's Specified Gas Emitter's Regulation.[248] Under this model, companies have the option of meeting the regulatory requirement by reducing emissions, purchasing offsets, or contributing to a technology fund. The recommendations for a similar model at the federal level are:[249]

- Charge a technology fund price of at least $100 per tonne by 2020.
- Proactively manage the risk that offset credits may not equate to real emissions reductions.
- Allow unlimited trading between facilities within a set compliance period.
- Adopt a more stringent approach to the treatment of new facilities.
- Periodically review the system.

(iii) Develop a set of specific federal financial tools to encourage clean energy entrepreneurship

To successfully explore the significant opportunities available in the clean energy sector, entrepreneurs will need targeted and customized support. The Pembina Institute identified a number of public policy options in the 2013 report, *Competing in Clean Energy: Capitalizing on Canadian innovation in a $3 trillion economy*.[250] These options include financial instruments like bridge financing through increased funding of Sustainable Development Technology Canada or green bonds that can address the technological and commercial barriers to success.[251]

There is no denying there are significant, short-term economic benefits associated with oilsands expansion. However, focusing on the immediate economic benefits does not tell the entire story. Throughout this report, our objective has been to raise awareness of the lesser-known economic consequences of oilsands development; both those that are occurring in the near term, and those that present a risk to Canada's future competitiveness.

Long before it became the federal government's latest slogan, the Pembina Institute has been advocating for "responsible resource development."[252] It is increasingly apparent that safe, efficient, and balanced resource development is necessary not only to ensure the long-term sustainability of the environment, but also that of the Canadian economy.

"The lesser-known economic **consequences of oilsands development present a risk** to Canada's future competitiveness."

Notes

1. Government of Alberta, *Budget 2013 Responsible Change Fiscal Plan Tables* (2013), 130. http://www.finance.alberta.ca/publications/budget/budget2013/fiscal-plan-tables.pdf
2. This $1.5 billion includes oil and gas extraction and support activities and is net, after $1.9 billion in federal tax credits and deductions.
3. Statistics Canada, *Financial and Taxation Statistics for Enterprises,* 61-219-X (2011), 53. http://www.statcan.gc.ca/pub/61-219-x/61-219-x2011000-eng.pdf
4. Finance Canada, *Annual Financial Report of the Government of Canada: Fiscal Year 2011–12*, 6. http://www.fin.gc.ca/afr-rfa/2012/afr-rfa-eng.pdf
5. Petroleum Human Resources Council of Canada, *The Decade Ahead: Labour Market Outlook to 2022 for Canada's Oil & Gas Industry*, Petroleum Labour Market Information (Spring 2012), 23. http://www.petrohrsc.ca/media/85483/canada_labour_market_outlook_to_2022_report_may_2013.pdf
6. Direct jobs are the immediate jobs generated by a project or development, indirect jobs are the employment changes occurring in other businesses/industries that supply inputs to the project industry, and induced jobs are the jobs that result when the wages earned from the direct and indirect jobs are spent.
7. Please see the caveats later in Chapter 2 regarding CERI's modelling. Afshin Honarvar, Dinara Millington, Jon Rozhon, Thorn Walden, and Carlos Murillo, *Economic Impacts of Staged Development of Oil Sands Projects in Alberta (2010–2035)* Study no. 125 (Canadian Energy Research Institute, 2011), 31. http://www.ceri.ca/docs/CERIIOFinalReport.pdf
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13. Martin Lefebvre, *"Petrocurrency": Good or Bad for Canada's Economy?*, Economic Viewpoint (Desjardins, 2006), 1-2. http://www.desjardins.com/en/a_propos/etudes_economiques/actualites/point_vue_economique/pve61011.pdf
14. Carney, "Dutch Disease," speech.
15. Matt Krzepkowski and Jack Mintz, *Canadian Manufacturing Malaise: Three Hypotheses* (SPP Research Papers, 2013), 6. http://www.policyschool.ucalgary.ca/?q=content/canadian-manufacturing-malaise-three-hypotheses
16. Wardah Naim and Trevor Tombe, *Appreciate the Appreciation: Imported Inputs and Concern Over Dutch Disease* (SPP Research Papers, 2013), 1. http://www.policyschool.ucalgary.ca/?q=content/appreciate-appreciation-imported-inputs-and-concern-over-dutch-disease
17. Philip Cross, *Dutch Disease, Canadian Cure: How Manufacturers Adapted to the Higher Dollar* (Macdonald-Laurier Institute, 2013), 7-8. http://www.macdonaldlaurier.ca/files/pdf/Dutch-Disease-and-manufacturing-January2013.pdf
18. Peter Spiro, *More Stability, Please: A new policy approach to Canada's exchange rate* (Mowat Centre, 2013), 24. http://mowatcentre.ca/pdfs/mowatResearch/80.pdf
19. Tony Clarke, Diana Gibson, Brendan Haley and Jim Stanford, *The Bitumen Cliff: Lessons and Challenges of Bitumen Mega-Developments for Canada's Economy in an Age of Climate Change* (Canadian Centre for Policy Alternatives, 2013), 60-61. http://www.policyalternatives.ca/publications/reports/bitumen-cliff
20. Pembina Institute calculation: data source; Statistics Canada CANSIM Table 228-0060, "Merchandise imports and domestic exports, customs-based, by North American Produce Classification System (NAPCS), Canada, provinces and territories." http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=1760064
21. International Monetary Fund, *Canada 2012 Article IV Consultation*, 50-51.
22. MRB Partners, *O Canada (Part I)* and *Uh-Oh Canada (Part II)* (2011), 16.
23. Pembina Institute calculations; data source: Statistics Canada, CANSIM Table 379-0030 "Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS), provinces and territories." http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=3790030.
24. Until 2008, Southern Ontario was the only region in Canada without a Federal Development Agency, ostensibly because of their historically robust economy. But in the February 2009 federal budget, a Southern Ontario Development Agency was created to "promote economic diversification and restructuring in Canada's industrial core." In: Beine et al., "Does the Canadian economy suffer from Dutch disease?", 469.
25. Case 3 in Honarvar et al., *Economic Impacts of Staged Development of Oil Sands Projects in Alberta*, 31.
26. Conference Board of Canada, Fuel for Thought: The Economic Benefits of Oil Sands Investment for Canada's Regions (2012), iii-iv. http://www.conferenceboard.ca/e-library/abstract.aspx?did=5148
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29. Government of Alberta. *Budget 2013: Responsible Change Overview* (2013), http://budget2013.alberta.ca/Fact-Card-Budget-2013-Overview.pdf
30. REN 21, *Renewables Global Status Report 2013*, 14. http://www.ren21.net/Portals/0/documents/Resources/GSR/2013/GSR2013_lowres.pdf

31. REN 21, *Renewables Global Status Report 2013*, 21.
32. The price of oil varies depending on the location of where it is drilled or mined, and its quality. We report the Western Texas Intermediate (WTI) price as this is generally considered to be the benchmark price for North American oil. The price of Alberta oilsands is Western Canadian Select (WCS), and is consistently less than WTI. WCS and WTI typically follow similar trends over time. In late 2012, however, the price of WCS began dropping much faster than that of WTI, increasing the differential and leading to what Alberta Premier Alison Redford termed the "bitumen bubble." The impacts of the bitumen bubble are further discussed in a Pembina Institute op-ed, "Vanquishing the "bitumen bubble" will require fresh ideas, not business as usual," (2013), http://www.pembina.org/op-ed/2413
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106. From the CCPA report (pg. 60), the petroleum sector devotes 0.75 per cent of industrial GDP to research. The manufacturing sector allocates over 5 times this amount.
107. Throughout much of this section, we look at how the composition of Canada's economy has changed over time. Subject to data availability, we focus on the period from 2002 to 2012, as 2002 is when the dollar started its rise, and 2012, in most cases, is the most recent year for which data is available. We recognize, however, that there will be some bias in the reported changes due to natural economic cycles that we have not accounted for.
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