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Canadian Crude Oil, Natural Gas and Petroleum Products:
Review of 2009 & Outlook to 2030

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Petroleum Resources Branch
Energy Sector

Canada

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Canadian Crude Oil, Natural Gas and Petroleum Products:
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Foreword

Canadian Crude Oil, Natural Gas and Petroleum Products: Review of 2009 & Outlook to 2030 is an annual working paper prepared by the Oil and Gas Policy and Regulatory Affairs Division (Oil and Gas Division) of Natural Resources Canada (NRCan). It provides summaries of crude oil, natural gas and petroleum product industry trends in Canada and the United States (US).

The objective of this report is to provide an understanding of the current state of North American oil, natural gas and petroleum product markets in a format that can be quickly and easily read.

Preparing this review and outlook helps the division better inform policy development. It is also a valuable tool for soliciting stakeholder feedback on our division's perceptions of rapidly evolving energy markets.

■ Structure of the Report

The report is divided into four sections:

1) *Executive Summary*;
2) *Introduction*;
3) *Review of 2009* (reviews the calendar year 2008 as well as 2009 and, where data is available, year-to-date 2010, to provide an overview of recent oil, natural gas and petroleum product market dynamics); and,
4) *Outlook to 2030* (provides a long-term view of oil and natural gas market fundamentals).

■ Timing of This Report

This is the first time we have analyzed crude oil, natural gas and petroleum products in a single report. This was partly done because the former Oil Division and Natural Gas Division were reorganized in May 2009 to form the new Oil and Gas Division. However, this integrated structure also allows a better understanding of the differences between the three markets, and how the three markets influence one another.

■ Sources

Various sources were used in preparing this report, including private consultants, industry associations, and federal government agencies in Canada and the US. Our main sources of statistical data were the National Energy Board (NEB), the US Energy Information Administration (EIA), and Statistics Canada.

While every effort is made to provide the most recent data, many sources are continually revising their data. As a result, data for recent years may differ slightly from what was reported in our previous report.

■ Oil and Gas Division Background

Oil and Gas Policy and Regulatory Affairs Division is part of the Petroleum Resources Branch, Energy Sector.

The Oil and Gas Division provides expert technical, regulatory, policy and economic information and advice on crude oil, natural gas and petroleum product markets, pipelines, and regulatory issues to the Minister of NRCan and the federal government.

In addition, the Oil and Gas Division advises the Minister of NRCan on matters related to statutory obligations under the *NEB Act and Transportation Safety Board Act.* The Division also includes the Pipeline Arbitration Secretariat.

■ Energy Sector Website

This report is available online at our website: http://www.nrcan.gc.ca/eneene/index-eng.php.

Other reports are also available at this website, including the bi-weekly Fuel Focus report, monthly Canadian Natural Gas: Monthly Market Update, and the Review of Issues Affecting the Price of Crude Oil.

■ Feedback

We appreciate your comments, suggestions, and questions. Questions and comments can be directed to Dan Cowan at: (613) 996-5411 or DanielJ.Cowan@NRCan-RNCan.gc.ca.

Executive Summary

The Global Recession

Years of sustained economic growth came to a sudden end in fall 2008 when the US-lead financial crisis triggered the worst economic slowdown since the Great Depression of the 1930s. The effects of the crisis were far reaching and no country was left unscathed. The Canadian economy shrank 2.6% in 2009, the most since 1982.

Canadian 2008 & 2009 Numbers at a Glance				
	Crude Oil		Natural Gas	
Year	**2008**	**2009**	**2008**	**2009**
Production	-1%	-1%	-4%	-7%
Domestic Demand	-3%	-5%	+0.7%	-1%
Prices	$103.5/bbl	$66.77/bbl	$7.33/MMBTU	$3.86/MMBTU
Imports	-2%	-5%	+21%	+25%
Exports	+1%	+1%	-4%	-11%

* Prices: $CAD – West Edmonton Par for Oil, AECO for natural gas

Energy supply and demand are pillars of modern economies. It follows that the global economic recession had real and tangible impacts on Canada's oil and gas industries, which are the focus of this report. Many of the key developments discussed in this section reflect the picture of a broader, economy wide recession.

The global recession started to affect industrial demand for natural gas and petroleum products towards the end of 2008, however this is masked by the annual data. The recession's full effect was more pronounced in 2009, when industrial demand for natural gas plummeted 8.4% in the US. Canadian industrial demand proved to be much more resilient and only fell by 1%.

Oil and Gas Price Review

The price of Canadian crude oil is set in a global oil market. Similarly, Canadian petroleum product prices reflect international crude oil prices and other factors such as seasonal demand and inventory levels. However, natural gas prices are more continental in nature, and are affected by markets in Canada and the US.

Crude Oil and natural gas prices peaked in July 2008 at $US 133 per barrel and over $US 13/MMBtu respectively. Prior to the recession of late 2008, crude oil prices were pushed higher and higher, by growing concerns over supplies, OPEC production cuts, and geopolitical uncertainties in some key producing regions[1]. Growing demand, particularly from Non-OPEC Asian countries like China, pushed oil prices higher, as did the devaluation of the US dollar against some key currencies, such as the Euro. Besides those "fundamental" factors, a major increase in large institutional investment (e.g. banks, hedge funds and insurance companies) and speculators is likely to have supported the spike in prices. The soaring oil price pushed refined petroleum products and natural gas prices ever higher as well.

Of note, the price of crude oil is the largest component in the price of refined products, such as gasoline, and product prices usually rise with the increase in the oil price. Natural gas is a product which can sometimes be substituted for petroleum products such as heavy fuel oil, and its price is somewhat influenced by the price of crude oil.

Within a year of their summer/fall 2008 peaks, both crude oil and natural gas lost 80% of their value on the market. Oil bottomed out at $30 per barrel in late December 2008 and natural gas averaged only $US 2.84 in September 2009.

Plummeting energy prices were the result of:

- The US financial crisis;
- The fall in equity markets; and
- Lower industrial production and lower energy demand.

[1] For additional detail, see our report, *Review of Issues Affecting the Price of Crude Oil*, October 2010.

Producer export revenues and cash flow declined, as did drilling rates and investments in the oil and gas industry.

In 2009, Canadian oil and gas drilling rates declined by half from 2008 levels, and global investment in the petroleum industry declined 19% in this same period.

As economies emerged from the recession, the price of crude oil clawed its way back and settled in the $US 70-80 range in the last quarter of 2009. Oil prices rose with the expectation that the global economic recovery would support increased oil demand. To the end of 2010, crude oil prices have remained fairly stable, in the $80-90 range.

Natural Gas

Natural gas prices have recovered to a much lesser extent. Improvements in horizontal drilling technology and multi-stage hydraulic fracturing are helping to unlock enormous natural gas reservoirs across North America. Shale gas has emerged as the new low-cost supply option and it is being characterized as a “game-changer”. Despite declining production in each of the last three years, the Western Canada Sedimentary Basin (WCSB) is no longer thought to be in permanent decline. Vast shale resources, particularly in Northeastern British Columbia, offer the possibility of increased domestic production over the long term.

Shale gas development is well established in the US and is growing quickly in Canada. Shale gas is providing a renewed optimism that North America now has an enormous and secure source of natural gas for decades to come. The burgeoning shale gas development comes on the heels of tremendous investments in Liquefied Natural Gas (LNG) import terminals.

Abundant shale gas, and abundant LNG import and regassification capacity, may act as a ceiling for natural gas prices and contribute to a lasting decoupling of oil and gas prices. Relatively low natural gas prices are fuelling efforts to expand natural gas’s market share, including in new applications such as transportation.

Natural Gas Paradigm Shift

For years industry spoke of the natural gas drilling and production treadmill, whereby more and more drilling was required to sustain production. During 2001-2006, North American natural gas production stagnated and prices spiked up and down as demand changed, leading us to describe this as a “supply limited market”. Unconventional production is changing the story. Nowhere is this more clear than in the US in 2009, when natural gas drilling collapsed (down 44%) and yet overall production grew by 3%. The strength in natural gas production is due to the shift towards horizontal wells targeting shale gas, which are typically much more productive than traditional vertical gas wells targeting conventional production. Similar trends could emerge in Canada as unconventional gas development grows in the future. Clearly the North American natural gas market is no longer supply limited, but is in a period of relative abundance.

Crude Oil

The shift towards unconventional production also holds on the oil side. New technology, successfully employed in shale gas developments (including horizontal drilling and multi-stage fracture stimulation) has successfully been employed in the Bakken oil formation in Saskatchewan, and more recently in the Pembina oil field in Alberta. In addition, it’s now clear that Canada’s mature oil fields could be revitalized, using unconventional production techniques.

Oil Sands

By early 2009, with the recession driving crude oil prices down, $100 billion in oil sands projects were on hold. However, oil prices subsequently recovered following the recession, and oilsands investments and developments are now once again back on track for rapid growth. Within the last year, rising petroleum prices have prompted the re-start of a variety of oil sands mining and in-situ projects

including: Suncor Energy's Firebag expansion, Imperial Oil's Kearl project, Cenovus's Narrows Lake project, Devon Energy's Jackfish expansion, and ConocoPhillips and Total's Surmont project.

By 2030, oilsands production is expected to account for up to 90% of Canadian production. The shift towards unconventional production has long been anticipated as 97% of Canada's proved oil reserves are in the form of oil sands. New processes and improvements in efficiencies are also helping to curb the expected demand for natural gas per barrel of oilsands produced.

Refined Petroleum Products

Overall, demand for refined products in Canada slowed down in 2008 along with the worldwide economic slowdown, and continued to decline in 2009. In fact, demand in 2009 was 6% lower than in 2008 at 96.5 billion litres, the lowest since 2002.

In 2009 Canadians consumed 42.3 billion litres of gasoline, an increase of 0.6 billion litres over 2008, a year when gasoline consumption had dropped by 0.5 billion litres.

Domestic sales of diesel fuel in 2009 were 26.0 billion litres, 8% lower than the year before. In 2007 and 2008 diesel demand had increased, a reflection of the strong growth in the Canadian economy and a growing proportion of diesel-powered vehicles in the fleet.

Demand for heating oil, or light fuel oil, totalled 3.4 billion litres in 2009, 0.4 billion litres or 10% below 2008. This mainly reflects the loss of share to natural gas and electricity in the space heating markets of Ontario and Quebec.

Canadian refinery capacity has increased slightly over the last decade – despite the closure of the Petro-Canada refinery in Ontario 2005. The refinery utilization rates have been dropping steadily since 2004, declining more significantly in 2009 because of lower demand for oil products, poor refining economics stemming from the economic downturn, and unscheduled refinery shut-downs.

Canadian gasoline prices in 2009 and 2010 were less volatile than in 2008, averaging 95 cents a litre in 2009 and $1.04 in 2010, down from the $1.14 registered in 2008. Diesel fuel prices averaged 90 cents per litre in 2009 and $1.01 in 2010, compared to $1.25 per litre in 2008.

Resource Size and Adequacy

Unconventional resources are also helping to stem concerns about Canada's long term ability to satisfy its energy needs. Canada's proved oil reserves are now the third largest in the world at 174.2 billion barrels (Bbl). On account of Alberta's oil sands, Canada now has at least 175 years of remaining crude oil reserves, at current production rates.

New estimates for natural gas resources are being developed to account for shale gas. North America is now thought to have over 100 years of natural gas supply at current production rates, largely on account of shale gas. It's clear that Canada has abundant oil and natural gas for long-term energy needs.

Outlook to 2030

Crude Oil

The crude oil price outlook to 2030 (from expert consultants and energy forecasters) shows a tendency towards rising prices. However, there is no consensus, which is not surprising given the variety of factors which can influence the price of oil.

A survey of Canadian crude oil production forecasts shows considerable variability particularly in the long-run. However, all of the forecasts show a clear shift towards the oil sands and a decline in Canada's conventional oil production. All of the forecasters expect that the decline in conventional oil production will be more than offset by rising oil sands production.

Overall, Canada's oil sands production could more than triple by 2030. Canada has a large and growing net surplus of crude oil. The domestic market for oil sands production could grow with rising

production. Surplus Canadian crude oil production will help meet the demands for oil in the US market, and could possibly be exported to a new market in Asia.

Natural Gas

A survey of expert consultants and energy forecasters show that North American natural gas demand is widely anticipated to increase by about 1% per year through to 2030. Canadian natural gas production is expected to continue a slow decline or remain stagnant until 2013 or 2014, after which production begins to rise slowly, due to unconventional gas development. Combined with Canadian natural gas demand growth, this implies a continued drop in Canadian natural gas exports to the US. The expected impact will be continuing declining natural gas exports to the US.

Natural gas prices are inherently hard to predict, even more so at a time when enormous supplies are on the verge of hitting the market. However, according to the forecasters surveyed, natural gas prices will gradually increase over the Outlook period to 2030. Natural gas is expected to continue trading at a considerable discount to crude oil on an energy content basis throughout the forecast period. Forecasters expect crude oil and natural gas prices to remain decoupled on an energy-content basis and for the price differential to widen somewhat.

Introduction

Importance of the Oil and Gas Industry to the Canadian Economy

Oil and natural gas are vital sources of energy for the world and will likely remain so for many years to come. The International Energy Agency (IEA) projects that oil and natural gas will provide 50% of the world's energy mix in 2035.

Oil is a key product for the world's agriculture industry. "The energy in one barrel of oil," notes the New Scientist (June 28/08), "is equivalent to that of five labourers working non-stop for a year." Oil is truly a key fuel which has helped the world's civilization advance in the 20th and 21st century.

In North America, two-thirds of oil is used in the transportation sector. Canada is geographically vast and oil gives us gasoline, diesel, and jet fuel to get around. From oil we get thousands of key products, from petrochemicals to building materials to plastics. Oil and natural gas are both used for power generation and as a heat source.

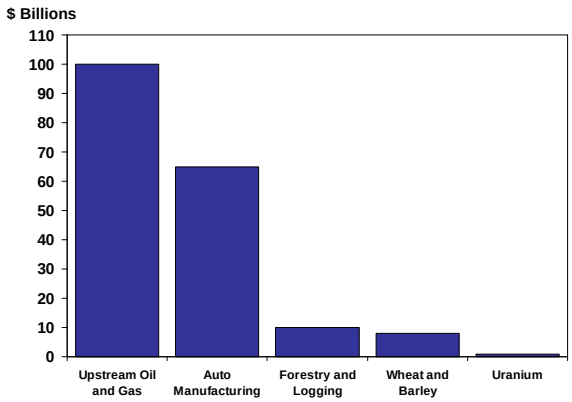
Like oil, natural gas is a crucially important energy source for consumers and business. Natural gas is used in the production of fertilizers and so plays a key role in food production. In Canada, natural gas is also used to extract oil from the oil sands.

The oil and natural gas industries are major drivers of Canada's economy:

- An ARC Financial report estimates that upstream oil and gas accounts for $100 billion of revenue annually in Canada, considerably more than the next largest product group (autos) at $65 billion.
- Over the next 25 years, Canadian Energy Research Institute (CERI) expects the Canadian oil and gas industry to sustain almost 25 million person years of employment, or almost one million jobs each year[2], and have a $3.6 trillion ($2008) impact on the Canadian Economy.
- Petroleum companies make up 20 to 30% of the value of the Toronto Stock Exchange and directly account for about 5% of Canada's GDP.
- $54 billion in Canadian oil and natural gas capital investment in 2008[3].
- In 2009, Canada's petroleum exports (crude oil, petroleum products, and natural gas) accounted for 21% of all Canada's exports. Oil and natural gas exports are a key component of Canada's merchandise trade surplus with the outside world. This surplus benefits all Canadians[4].
- Millions of Canadians are affected by the petroleum industry through employment, or ownership in shares of companies, Registered Retirement Savings Plans and mutual funds.
- The high value of the Canadian dollar is largely due to the value of oil and gas produced in Canada.

The oil and gas industry is a key source of revenue for federal and provincial governments. In 2008, the Canadian oil and gas industry paid $26 billion in taxes and royalties to governments[5]. Over the next 25 years, the federal government could receive $409 billion in tax revenue from the oil and gas industry, while provinces could take in an additional $282 billion[6].

Annual Revenue for Major Canadian Industries



Source: ARC Financial

[2] There are not 1 million people working directly in oil and gas in Canada. The figure includes indirect jobs such as services driven by oil and gas jobs.

[3] CAPP Website

[4] Statistics Canada (2008) CANSIM Table 228-0003

[5] CAPP Website

[6] CERI report on the Economic Impact of the Petroleum Industry in Canada, July 2009.

Review of 2009 – Crude Oil Market

Market Structure

Canada is the 6th largest oil producer in the world, and a price taker in a global oil market. Canadian crude oil is sold both domestically and in the US market at the world price. Despite the fact that Canada is a major net exporter of crude oil, refineries in Atlantic Canada and central Canada continue to import crude from producers overseas. This occurs because of the low cost of moving crude oil by ship, and the relatively high cost of pipelining crude oil across Canada. Some of the crude imported is re-exported to the US in the form of refined petroleum products.

Crude Oil Demand

Refineries transform crude oil into refined products which are consumed by industry and the public. The figure below shows the total amount of crude oil consumed by refineries (both imports and domestic crude oil) to meet the demand for refined products in Canada.

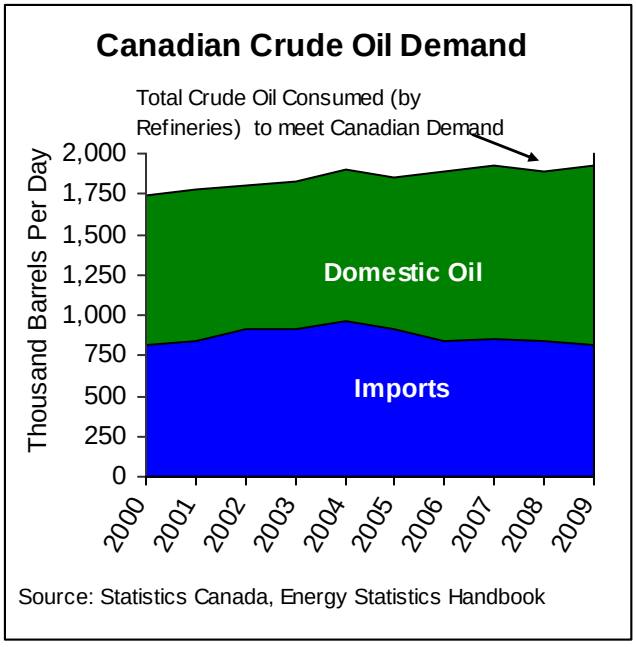
As seen in the figure below, between 2000 and 2009, Canadian demand for crude oil ranged from 1.7 to 1.85 million barrels per day (mb/d). Canadian demand for crude oil peaked in 2007, at 1.85 mb/d.

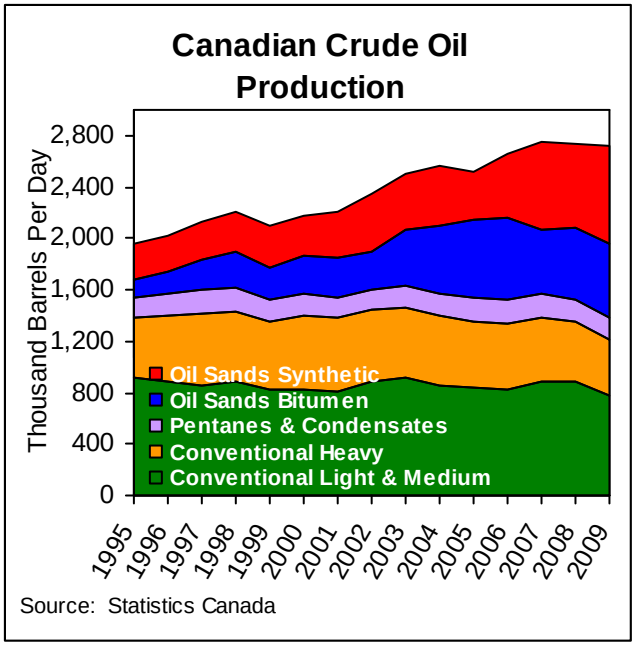
In 2008 and 2009, Canadian demand for crude oil slowed down, reflecting the impact of the global economic slowdown. However, there are now some signs that the global economic recovery has begun. Like other countries, Canadian crude oil demand could recover somewhat with the global economic recovery.

Canada consumes far less crude oil than it produces, and this situation is likely to continue into the foreseeable future. In 2009, Canada recorded a huge net surplus of more than 840 thousand barrels per day (kb/d). Nearly all crude oil exported from Canada was to the US market.

Crude Oil Production

The figure below shows total Canadian crude oil production for the 1995 to 2009 period. Canadian oil production is growing quickly. Between 1995 and 2009 Canadian crude oil production grew from 1.97 mb/d to 2.72 mb/d. All of the increase in Canada's oil production came from the oil sands, where production rose from 430 kb/d in 1995 to 1.34 mb/d in 2009. For 2009, despite a significant drop in the price of crude, and a large drop in conventional oil drilling, Canadian crude oil production of 2.72 mb/d was very close to its output rate of 2008 (2.74 mb/d). In fact Canada's crude oil production fell by less than one percent. The growth in oil sands output offset almost all of the loss in conventional crude oil production.





Canadian Crude Production by Province and Territory (kb/d)														
Domestic Production	B.C.		Alberta		Sask.		Manitoba		East Coast		Rest of Canada		Canada	
	08	09	08	09	08	09	08	09	08	09	08	09	08	09
Heavy			156	145	309	289							465	434
Light/Medium	23	22	347	316	130	134	23	26	342	268	18	17	883	782
Condensates	4	4	15	14					11	8			31	27
Pentanes	6	7	141	132	1	1					2	2	149	142
Bitumen			549	575									549	575
Synthetic			653	764									653	764
Total Production	33	33	1,861	1,946	440	424	23	26	353	276	20	19	2,731	2,724
Percentage	1	1	68	71	16	16	1	1	13	10	1	1	100%	100%

Source: Statistics Canada, Energy Statistics Handbook. Figures are rounded.

The table above shows Canadian crude oil production by province and territory. Canadian crude oil production is spread out across Canada; however, most Canadian production is centred in the Western Canadian Sedimentary Basin. In 2009, Alberta dominated Canadian crude oil output with 71% of the nation's total. The Western Canadian provinces of Alberta, British Columbia, Saskatchewan and Manitoba accounted for 89% of production. Newfoundland and Labrador offshore production made up almost 10% of total Canadian output. Finally, Ontario, Nova Scotia and the Northwest Territories production make up the remaining 1% of production.

Within Canada, there is a fairly high degree of concentration of oil production within a small number of producers. In 2009, the top 10 Canadian oil producers controlled 65% of total Canadian oil production. The August 2009 merger between Suncor Energy and Petro-Canada created Canada's largest energy company, with crude oil production at 393 thousand barrels per day (kb/d) in 2009.

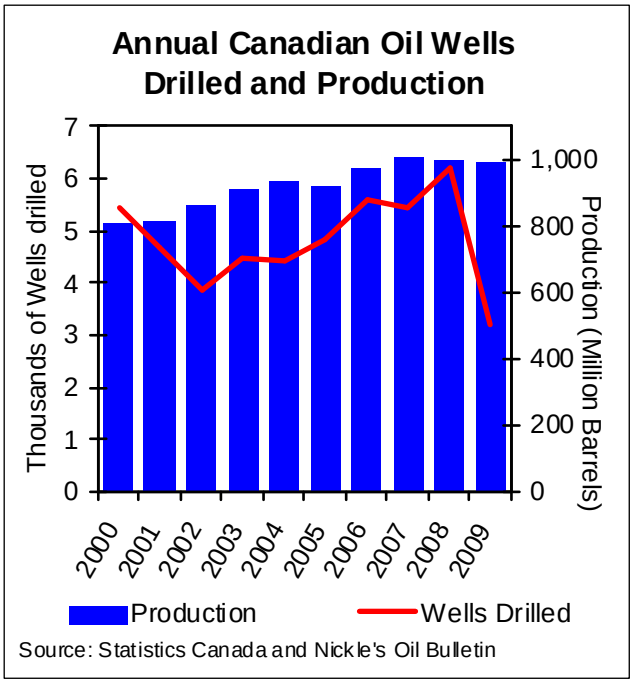
2009 Top 10 Canadian Oil Producers			
Rank	Company	kb/d	Percent
1	Suncor Energy*	393.5	14.4%
2	Canadian Natural*	284.8	10.5%
3	Imperial Oil*	244.0	9.0%
4	Husky Energy*	205.1	7.5%
5	Shell Canada	119.0	4.4%
6	Encana*[1]	115.8	4.3%
7	Conoco Phillips	113.0	4.1%
8	Penn West*	104.0	3.8%
9	Canadian Oil Sands Trust*	103.1	3.8%
10	Devon Canada	94.6	3.5%
Total Canada production		2,724	100%

Source: Oilweek Magazine, July 2010. * denotes gross production
[1] Encana split into two energy companies on December 1, 2010.

Oil Wells Drilled

The total number of oil wells drilled in Canada in 2009 was lower than in previous years. In 2009, 3,197 oil wells were completed compared to 6,223 in 2008, which translates into a 49% drop. Note that wells drilled is an imperfect measure of unconventional oil development, as oil sands production is extracted through in situ processes (which requires drilling), but also by mining (which does not involve drilling). The graph below illustrates that in 2009, oil wells drilled were the lowest of the decade. Lower commodity prices throughout the first half of 2009 were a major factor contributing to the lower oil well count.

In 2009, despite the huge drop in conventional drilling, Canadian crude oil production remained virtually unchanged from its 2008 level because increased oil sands production made up for a loss of conventional production.



Source: Statistics Canada and Nickle's Oil Bulletin

Canada's Oil Resources and Reserves

Oil sands are a naturally occurring mixture of sand or clay, water and bitumen[7]. Canada's oil sands are found in three main areas: Athabasca, Peace River and Cold Lake. Canada's oil sands are extracted using both mining and in situ drilling techniques. Around 20% of Canada's oil sands reserves are close enough to the surface (up to 75 metres) to be mined. The remaining oil sands reserves are too deep to be mined (more than 75 metres) and in-situ drilling techniques are required to extract the oil. In situ techniques use drilling technology to inject steam into a deposit to heat the oil sand thus lowering the viscosity of the bitumen. The hot bitumen migrates towards the wells, bringing the oil to the surface, while the sand is left in place.

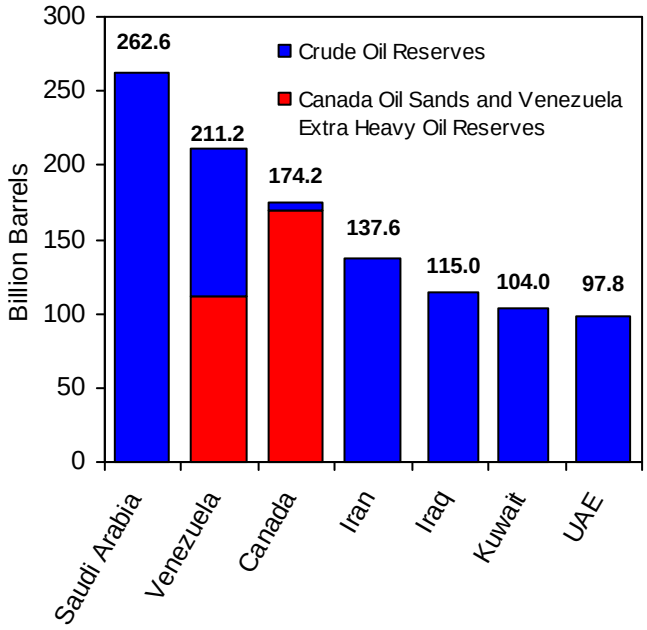
Canada's oil sands are still in their early stages of development. Since 1967, only seven billion barrels (bbl) of crude oil has been extracted from the oil sands. In 2009, 544 million barrels of bitumen were extracted from the oil sands (approximately 1.5 mb/d). In 2009, all crude bitumen produced from mining, as well as a small portion (about 12%) of in situ production was upgraded in Alberta, yielding 279 million barrels of synthetic oil.

In Canada, the amount of discovered in-place (not all in-place amounts are economically recoverable) bitumen resources (oil sands) is estimated at 1.8 trillion barrels. This resource is so vast it exceeds the total volume of world oil production to date. For comparison, the 150 year cumulative total of world oil production-to-date is approximately 1 trillion barrels.

Proved oil reserves are economically recoverable with a high degree of certainty using current technology. Ten percent of Canada's discovered bitumen resources are now considered to be proved. Canada's proved oil sands reserves are estimated at 169.9 bbl.

As shown in the figure above, Canada's proved oil reserves are the third largest in the world at 174.2 bbl. Only Saudi Arabia, with 262.6 bbl of oil, and Venezuela with 211.2 bbl have a larger volume of proved oil reserves. The seven countries shown collectively represent about 75% of the world's proved oil reserves. Six of the countries are Organization of Petroleum Exporting Countries (OPEC) members (Canada is not). Today, OPEC controls 72% of the world's oil reserves, and produces about 40% of the world's oil production.

World's Top Proved Oil Reserves



Source: Oil and Gas Journal, December 6, 2010; CAPP

Canada accounts for about 12% of the world's proved oil reserves, and 97% of Canadian reserves are in the form of oil sands. Based on the current rate of production, Canada has at least 175 years of crude oil reserves.

In the future, with technological improvements, the volume of Canada's proved oil sands reserves could grow substantially. The province of Alberta estimates that proved oil sands reserves, currently estimated at 169.9 bbl, could grow to 315 bbl as technology improves. This does not include oil sands that could one day be extracted from Saskatchewan.

Unlike the oil sands, Canada's conventional oil reserves are spread across Canada's provinces and territories. Canada's conventional proved oil reserves are currently estimated at 4.3 bbl. The table on the next page shows the location of Canada's proved conventional oil reserves by province and territory. Alberta holds around 35% of Canada's conventional oil reserves and the Western Canadian provinces of Alberta, British Columbia, Saskatchewan and Manitoba collectively account for about 61% of Canada's conventional oil reserves.

[7] The extremely viscous oil contained in oilsands deposits is commonly referred to as bitumen. It is a very heavy oil.

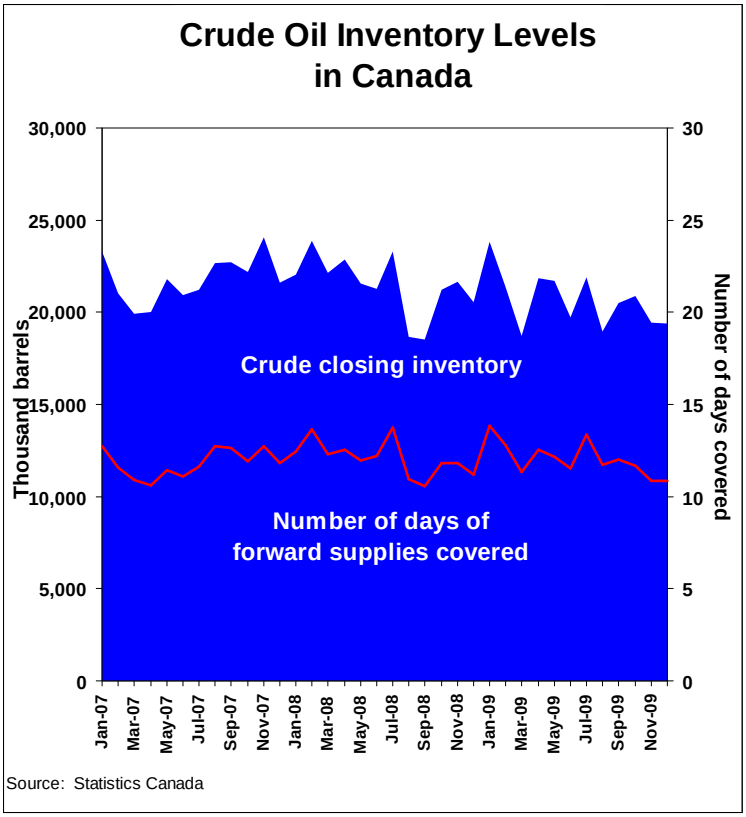
Canadian Conventional Crude Oil Reserves		
Location	**Million barrels**	**Percent**
British Columbia	113	2.6%
Alberta	1,495	34.6%
Saskatchewan	959	22.2%
Manitoba	53	1.2%
Ontario	10	0.2%
Mainland Territories	12	0.3%
Mackenzie Beaufort	339	7.8%
East Coast Offshore	1,344	31.1%
Total	**4,325**	**100.0%**

Source: Canadian Association of Petroleum Producers

The East Coast offshore areas represent about 31% of conventional oil reserves. Canada's remaining proved conventional oil reserves are located in Ontario, the Mackenzie/Beaufort Area and the Mainland Territories.

Crude Oil Inventories

Crude oil is mainly stored at refineries and near major pipelines. The graph at the top right shows the monthly Canadian crude oil inventory levels at the Canadian refineries over the January 2007 to December 2009 period.



Source: Statistics Canada

Monthly Canadian crude oil inventories levels ranged from just under 18,518 thousand barrels to almost 23,827 thousand barrels. Seasonal variations in crude oil inventory levels are also visible. The winter months show spikes in inventories for refineries to produce heating oil. In the January 2007 to December 2009 period, crude oil inventories at refineries varied between 11 and 14 days of forward supplies.

Canadian refineries constantly replenish their supplies of crude oil through pipelines and crude oil tankers to ensure that adequate supplies are maintained for Canadians. Refineries in Atlantic Canada have the highest crude oil inventories in terms of forward supply levels as they rely on imported crude almost exclusively.

Crude Oil Prices

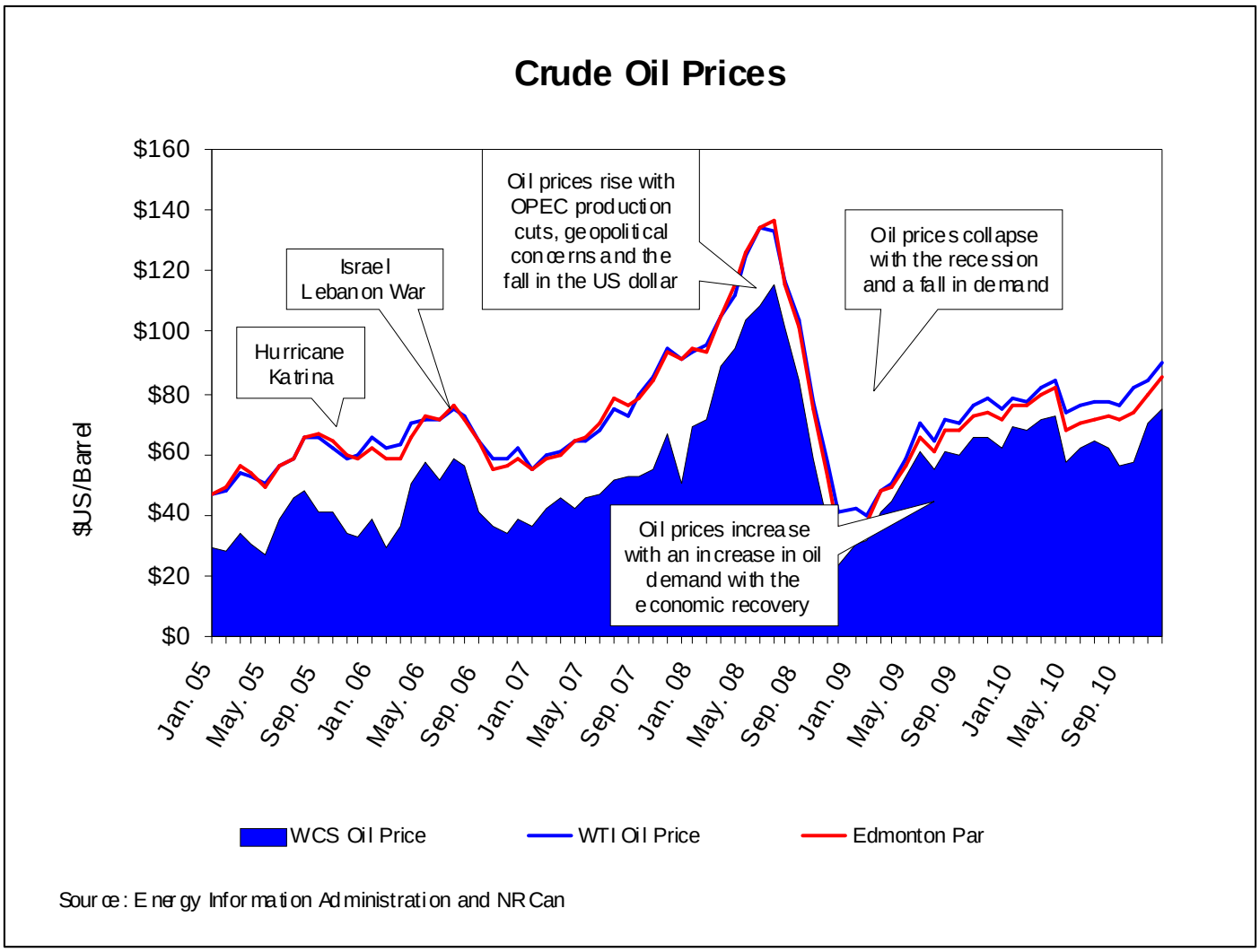
West Texas Intermediate Crude oil (WTI) is a benchmark crude oil for the North American market, and Edmonton Par and Western Canadian Select (WCS) are benchmarks crude oils for the Canadian market. Both Edmonton Par and WTI are high-quality low sulphur crude oils with API gravity levels of around 40°. In contrast, WCS is a heavy crude oil with an API gravity level of 20.5°.

Oil sands crude oil does not flow naturally in pipelines because it is too dense. A diluent is normally blended with the oil sands bitumen to allow it to flow in pipelines. For the purpose of meeting pipeline viscosity and density specifications, oil sands bitumen is blended with either synthetic crude oil (synbit) and/or condensate (dilbit).

WCS is a dilsynbit (diluent – synthetic – bitumen) blend with an API gravity level of 20.5°. WCS has satisfied the criteria to become a benchmark with production volumes of around 250,000 barrels per day and may grow from this number, whereas WTI is declining from its current volume of 300,000 - 400,000 barrels per day.

The graph on the next page shows monthly WTI, Edmonton Par and WCS crude oil prices for the January 2005 to December 2010. WTI and Edmonton Par crude oils are sold at prices in close proximity to each other as these crude oils are of similar quality.

Since WCS is a heavy sour grade, it requires



more time and energy to refine it. As a result, WCS is sold at a discount to WTI. Between 2006 and 2008, the average annual differential between WTI and WCS was between $20 and $24 per barrel. Since the fall of 2008, the price differential between WTI and WCS narrowed with growing demand for heavier Canadian crude oil from US refineries. By 2009, the price differential between WCS and WTI was only $9.67 per barrel.

The higher price for heavier crude oils has improved the economics of developments such as the oil sands. By early 2009, with the recession driving crude oil prices down, $100 billion in oil sands projects were on hold. However, with the recovery in oil prices, oilsands projects are now once again back on track for rapid growth. Within the last year, rising petroleum prices have prompted the re-start of a variety of oil sands mining and in-situ projects including: Suncor Energy's Firebag expansion, Imperial Oil's Kearl project, Cenovus' Narrows Lake project, Devon Energy's Jackfish expansion, and ConocoPhillips and Total's Surmont project.

Volatile Crude Oil Prices

As seen in the graph, the January 2007 to September 2010 period was characterized by high oil price volatility (particularly in 07/08). WTI crude oil rose from a monthly average of $US 54.50 per barrel in January 2007 to over $US 133 per barrel by June of 2008.

A number of traditional factors contributed to the escalation in the price of crude oil such as:

- OPEC production cuts;
- High oil demand (particularly China);
- Reduced spare capacity and inventory levels;
- Oil price subsidies; and,
- Geopolitical concerns.

New emerging factors also had an effect:

- The declining value of the US dollar;
- The emergence of oil as a new investment class; and,

- Increased flows of money into the crude oil futures market (banks, hedge funds, and insurance companies).

The major drop in the price of oil that was experienced in the fall of 2008 was mainly a response to a drop in the demand for oil in the face of the recession and the financial crisis. The daily price of oil fell to a low of US$30 per barrel in December 2008. Oil prices rebounded, in the summer and fall of 2009, with the expectation of higher crude oil demand with the economic recovery. By the end of 2009, oil prices were trading at around US$75 per barrel, and through November 2010, have remained in the $80 per barrel range. In 2009, the price of crude oil averaged 62% of the price in 2008.

The Oil and Gas Division prepared an in depth report on the factors causing high oil price volatility. The crude oil issues report can now be seen on Natural Resources Canada's reports and publications website[8].

Crude Oil Imports, Exports and Trade Revenues

For geographic and economic reasons, oil is exported from the west and the Atlantic offshore and imported into eastern and central Canada. On balance, Canada is a large and growing net oil exporter. Domestic sources supply all of the crude oil used in Western Canada and close to three quarters of Ontario's crude oil demand. Most crude oil demand in Quebec (365 kb/d in 2009) and the Atlantic provinces (372 kb/d in 2009) is met with imports.

The table at the top right shows Canadian oil imports by source for 2008 and 2009. In 2008, Canada imported 846 kb/d of crude oil. With the recession, imports fell by 5% to 807 kb/d in 2009. In 2009, 360 kb/d or 45% of Canada's crude oil imports came from OPEC member countries. Twenty-seven percent of Canada's crude oil imports came from the North Sea, and other regions accounted for the remaining 28% of imports.

The table at right compares Canada's crude oil exports across different US Petroleum Administration for Defence Districts (PADD). Canada exported 1.86 mb/d of crude oil in 2008. In 2009, Canadian crude oil exports were slightly higher at 1.88 mb/d.

Canadian Crude Oil Imports by Country (kb/d)

Rank	Country	2008	2009
1	Algeria	196	149
2	Norway	143	122
3	United Kingdom	120	93
4	Saudi Arabia	66	71
5	Angola	82	43
6	Nigeria	29	34
7	Venezuela	25	33
8	Iraq	60	26
9	Mexico	21	22
10	Russia	26	18
	All others	78	196
Total Canadian Imports		**846**	**807**

Source: Statistics Canada Energy Statistics Handbook

The table below also compares exports to the US with exports to other countries, showing that more than 99% of total Canadian crude oil exports are destined for the US market. More than three quarters of Canada's crude oil exports go to the US Mid-West region and US Rocky Mountain regions.

Canadian Crude Oil Exports by Destination (kb/d)

Export Area	2008	2009
US East Coast	249	225
US Mid-West	1,118	1,158
US Gulf Coast	9	14
US Rocky Mountain Region	318	313
US West Coast	153	158
Total Exports to US	1,846	1,868
Exports to other Countries	8	14
Total Exports	**1,856**	**1,882**

Source: Statistics Canada Energy Statistics Handbook

In 2009, Canadian export revenues from crude oil of $43 billion were 36% lower than its 2008 level ($67 billion). However, unlike with natural gas, this reduction in export revenues was not coupled with a reduction in export volumes. In 2009, at 687 million barrels per year, crude oil export volumes were up 1% from its 2008 level (679 million barrels).

[8] The report titled "Review of Issues Affecting the Price of Crude Oil" can be downloaded at: http://nrcan.gc.ca/eneene/sources/crubru/pcopdp/index-eng.php

Crude Oil Exports and Imports			
	2008	2009	Change
Exports (Gross)			
Volume (million barrels)	679	687	+1%
Avg. Export Price (C$/B)	$99.25	$66.35	-33%
Export Revenue (billion)	$67.4	$42.8	-36%
Imports (Gross)			
Volume (million barrels)	310	295	-5%
Avg. Import Price (C$/B)	$109.65	$72.05	-34%
Import Expense (billion)	$34.0	$21.2	-38%
Net Exports			
Volume (million barrels)	369	392	+6%
Net Export Revenue (billion)	$33.4	$21.6	-35%

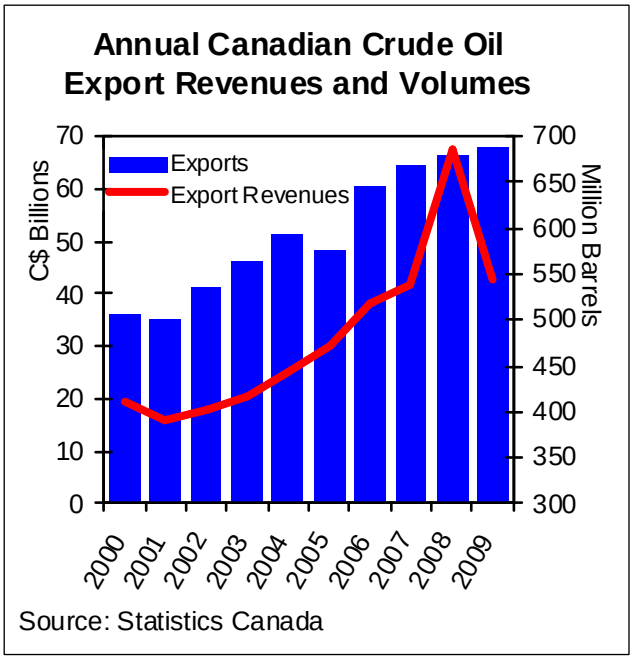
Source: Statistics Canada, Energy Statistics Handbook

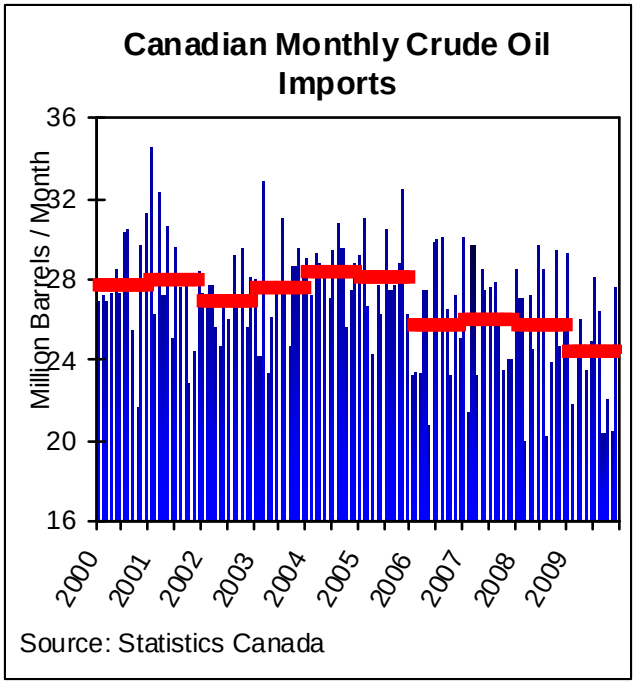
The lower revenue figures are therefore not a reflection of less product being exported, but of the lower price of Canadian crude oil in 2009 compared with 2008. In 2009, the average Canadian crude oil export price, at $66.35 Cdn/bl, was one third lower compared to the average of $99.25 Cdn/bl in 2008. The lower price for Canada's commodity exports had a major impact on Canada's annual trade balance – In 2009, it fell into deficit, for the first time since 1975. Lower prices for commodities led to trade deficits in the 2nd and 3rd quarters of 2010.

The drop in the value of crude oil also had a major impact on the Canadian dollar, which fell to 81 cents against the US dollar in December 2008. As crude oil prices recovered in 2009, the Canadian dollar approached par with the US dollar. It is for this reason that the Canadian dollar is now commonly described as a "petro dollar".

Canada's refineries import light sweet (low sulphur) crude oil which sells at a premium compared to the heavier crude oils which Canada exports to the United States. This explains the difference between the average import price for crude oil and the average export price for Canadian crude oil.

The figure above highlights both the monthly volatility of Canadian imports, as well as their seasonal pattern. Canadian crude oil imports typically increase to meet the peak demand for heating fuel during the winter months and gasoline demand during the peak summer driving season. In recent years, the overall demand for crude oil imports in Eastern Canada has been declining in response to increased use of domestic crude oil, the closure of the Petro-Canada refinery in Ontario, lower utilization rates and the effects of the 2008/2009 recession.





Review of 2009 – Natural Gas Market

Market Structure

The Canadian natural gas market is part of a continental market, and is affected by market conditions in both Canada and the US. In this market, natural gas flows seamlessly across borders via extensive pipeline networks connecting supply basins to demand centers. Regional prices, reflecting natural gas pipeline transportation costs, are established within this market. Unlike crude oil, there is no global price for natural gas.

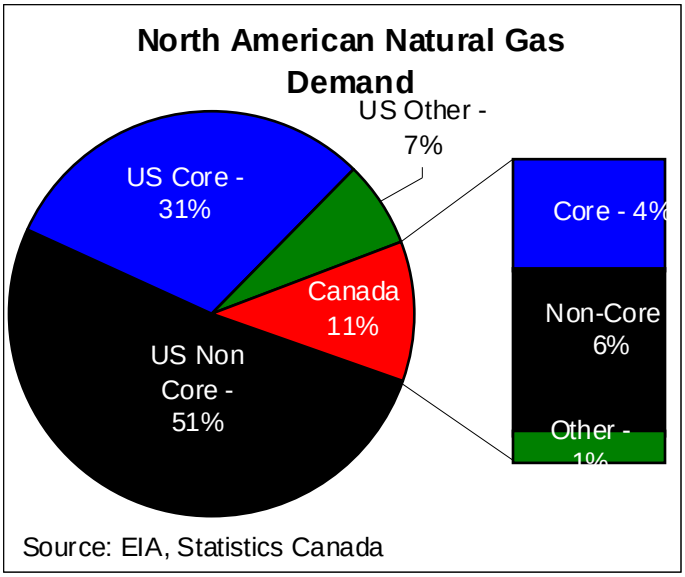
Natural Gas Demand

Total North American demand for natural gas in 2009 was about 25.5 Tcf (trillion cubic feet) or about 70 Bcf/d (billion cubic feet per day). Canadian natural gas demand represents about 11% of the combined Canada-US demand. Core demand includes natural gas used for space heating in the residential and commercial sectors, while non-core demand includes the industrial and power generation sectors. The graph below shows the components of 2009 North American natural gas demand.

The table above summarizes North American natural gas demand for 2008 and 2009. US demand fell in 2009, by 2.1%, largely as a result of the economic downturn. Canadian demand was also down, albeit by less than 1%. Overall, total North American demand was down 2% in 2009.

North American Natural Gas Demand				
	2008		2009	
	Bcf	Y/Y Chg.	Bcf	Y/Y Chg.
US Residential	4,872	3.2%	4,739	-2.7%
US Commercial	3,136	4.1%	3,095	-1.3%
US Industrial	6,650	0.0%	6,090	-8.4%
US Electric	6,668	-2.5%	6,888	3.3%
US Other (1)	1,900	1.5%	1,928	1.5%
Total US Demand	**23,227**	**0.6%**	**22,739**	**-2.1%**
US LNG Exports	39	-19%	33	-15%
US Exports to Mexico	365	25%	338	-7%
Total US Disp'n	**23,631**	**0.8%**	**23,111**	**-2.2%**
Cda. Residential	627	1.5%	626	-0.2%
Cda. Commercial	457	2.5%	468	2.4%
Cda. Ind. & Power Gen.	1,549	1.8%	1,534	-1.0%
Cda. Other (2)	136	-16.6%	115	-15.4%
Total Canadian Gas Sales	**2,719**	**0.7%**	**2,743**	**-0.9%**
Total N.A. Demand	**25,996**	**0.6%**	**25,482**	**-2.0%**
Total N.A. Disposition	**26,400**	**0.8%**	**25,854**	**-2.1%**

Sources: Statistics Canada, EIA
Notes: (1) US Other includes pipeline and distribution use, lease and plant fuel, and vehicle use. (2) Canadian other consists mainly of pipeline compressor fuel.

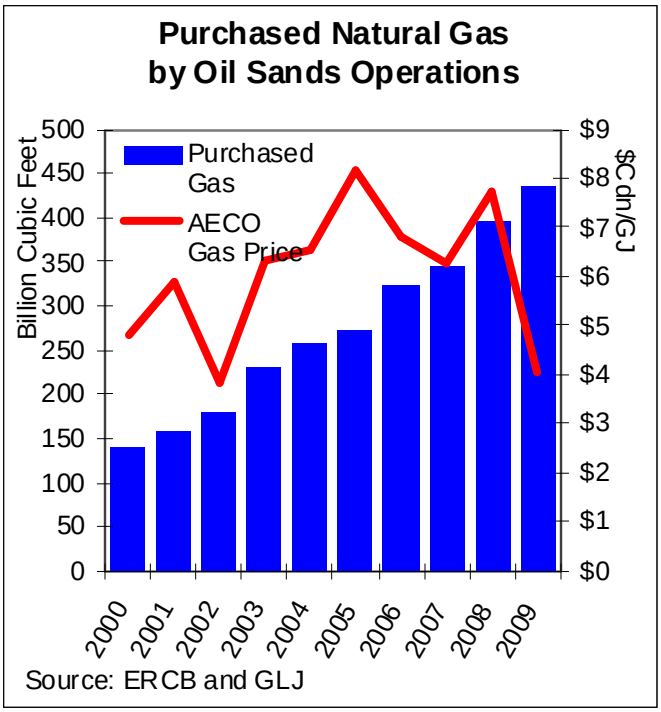


Source: EIA, Statistics Canada

Demand for natural gas in the industrial sector is largely derived demand, e.g. demand that arises due to the demand for another good or service.

As illustrated in the figure on the following page, expanding oil sands operations continue to increase their demand for natural gas. Purchased gas by the oil sands is now 432 Bcf/year or 1 Bcf/d. Alberta's Energy Resources Conservation Board (ERCB) expects this demand to double again by 2020. Low natural gas prices continue to make natural gas an economical fuel to use in oil sands operations.

Oil sands operations consume more than just purchased gas. Oil sands upgrading operations also produce their own natural gas that is used on site. The in situ operations also produce solution gas from bitumen wells. Therefore, total gas consumed in this industry is the sum of purchased gas, process gas, and solution gas produced at bitumen wells. Total gas use



by the oil sands sector, including gas used by the electricity cogeneration units on site at the oil sands operations, was 681 Bcf in 2009.

Natural gas for power generation remains the primary driver of North American demand growth since 2000. US demand for natural gas to generate electricity increased 32% since 2000 and now accounts for 26% of total North American demand. Despite volatile natural gas prices, the power generation sector has shown an increasing appetite for natural gas as environmental and cost pressures make natural gas-fired generators an attractive option for power generation.

A contributing factor to natural gas demand growth in the power generation sector in recent years are warmer summers, particularly in the US, which drives increased summer air conditioning requirements, and thus, increases gas demand for power generation.

Natural Gas Supply

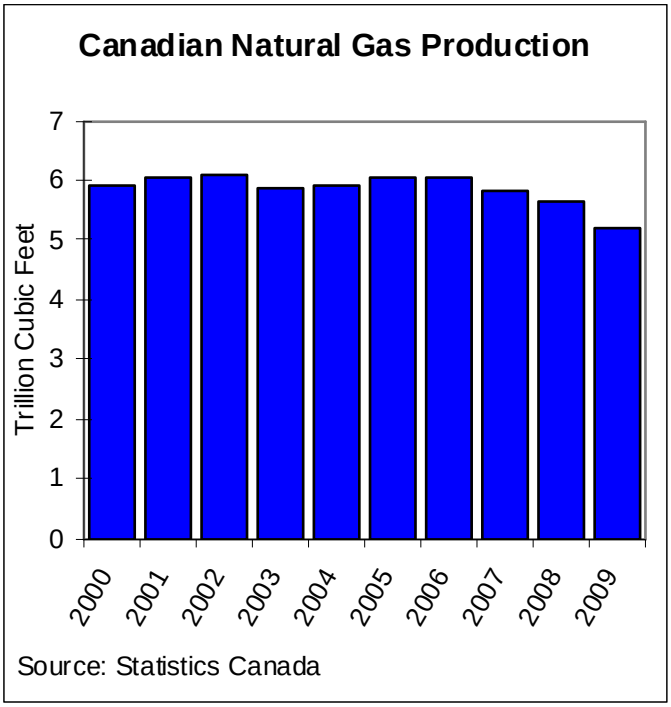
2008 was an interesting year for North American natural gas production. US production increased 5% largely on account of surging shale gas production. Meanwhile, Canadian production declined 4% owing to the maturing Western Canada Sedimentary Basin (WCSB). The trend continued in 2009 when US production increased 3% while Canadian production declined a further 7%. Refer to the table below for a split of each region.

North American Natural Gas Supply				
	2008	2009	09 vs. 08	
	Bcf	Bcf	Bcf	%
Alaska	398	397	-2	0%
Fed. Offshore GoM	2,327	2,433	106	5%
Louisiana	1,377	1,532	154	11%
New Mexico	1,446	1,404	-42	-3%
Oklahoma	1,913	1,858	-55	-3%
Texas	6,921	6,851	-70	-1%
Wyoming	2,275	2,359	84	4%
Other states	4,582	5,059	478	10%
Total US Prod'n	**21,240**	**21,893**	**653**	**3%**
Western Canada	5,459	5,082	-377	-7%
Scotian Shelf	161	124	-37	-23%
Candian Prod'n	**5,620**	**5,206**	**-414**	**-7%**
Total N.A. Prod'n	**26,860**	**27,099**	**239**	**1%**
US LNG Imports	352	452	100	29%
US Mexicain Imports	43	28	-15	-35%
Total N.A. Supply	**27,255**	**27,579**	**324**	**1%**

Source: EIA, Statistics Canada

In 2009, combined North American domestic natural gas production increased 239 Bcf (1%) to reach 27 Tcf. This is the fourth consecutive year of production increases and solidifies the trend of rising production.

The low price of natural gas is not impeding production of natural gas, as companies are actively pursuing shale gas production, which appears to still be economic. Canadian natural gas production peaked in 2002. Production fluctuated over the years, however recent years marked fairly significant declines.



As illustrated in the graph on the previous page, Canadian natural gas production was down nearly 6% in 2008 and a further 7% in 2009.

The Canadian supply picture stands in stark contrast to the US, which continues to record significant growth in gas production. Starting in 2006, the US had very strong year over year production growth including by 5% in 2008 and another 3% in 2009.

The surging production is primarily attributable to the improved economics and technology associated with unconventional gas, particularly shale gas.

2009 Top 10 Canadian Natural Gas Producers			
Rank	**Company**	**Bcf/d**	**Percent**
1	**EnCana Corporation**	1.99	13%
2	**Canadian Natural Resources**	1.29	8%
3	**ConocoPhillips Canada**	1.06	7%
4	**Talisman Energy Inc.**	0.72	5%
5	**Devon Energy Corp.**	0.67	4%
6	**Husky Energy Inc.**	0.54	4%
7	**Shell Canada**	0.53	3%
8	**Penn West Energy Trust**	0.44	3%
9	**Suncor Energy**	0.37	2%
10	**Apache Canada**	0.36	2%
Total Canadian Production		**15.28**	**100%**

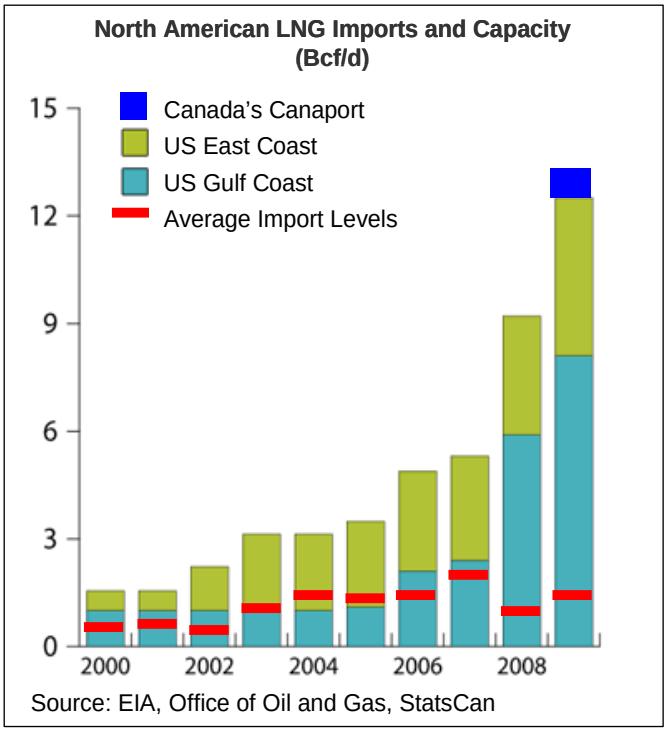
Source: Oilweek Magazine, July 2010.

The table above shows the top ten natural gas producers in Canada. While there are hundreds of natural gas producers in Canada, the top ten control 52% of production.

Liquefied Natural Gas (LNG)

For North America as a whole, one consequence of growing domestic natural gas production and falling prices is reduced Liquefied Natural Gas (LNG) imports. LNG imports were down over 50% in the US in 2008 and exhibited only a very modest recovery in 2009.

The US LNG imports and capacity graph highlights the huge excess of regassification capacity of LNG import facilities. There are also market participants who believe that Canadian shale gas production will eventually increase. These market participants are supporting a



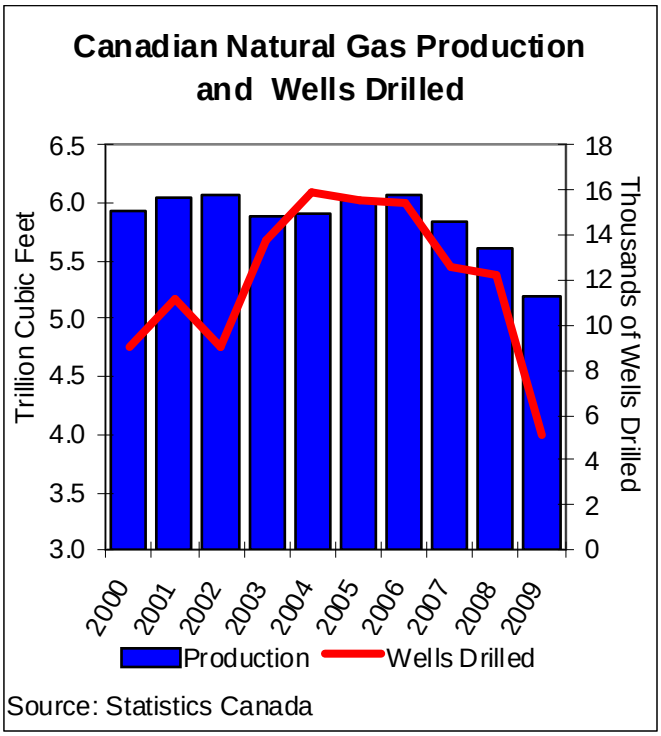
Canadian LNG Export project (Kitimat LNG), which would export liquefied shale gas to Asia.

The Canaport LNG terminal is currently Canada's only operational LNG import facility with a capacity of 1.2 bcf/d. All other LNG import and export proposals have been cancelled or delayed on account of:
1) difficulties securing long term supply commitments;
2) concerns over existing excess regassification capacity in North America; and,
3) the prospects for domestic shale gas as a new long term source of natural gas.

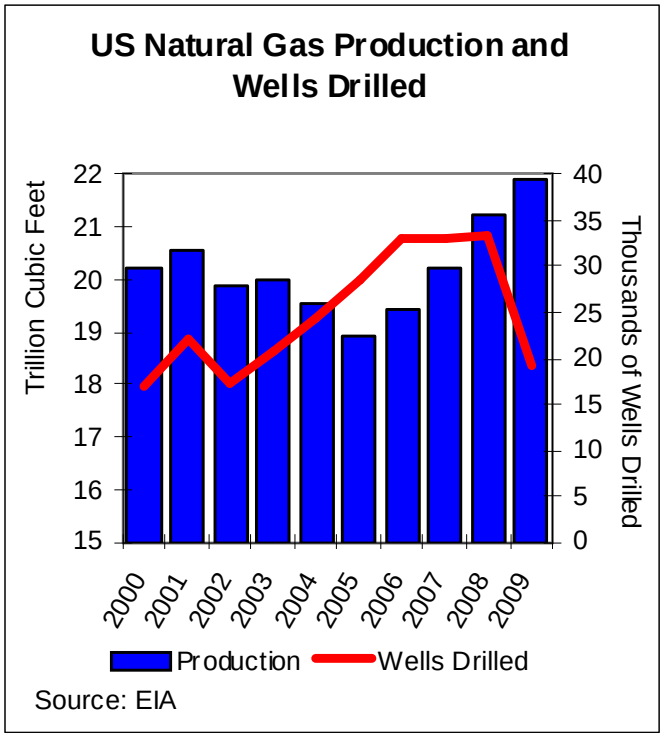
Natural Gas Wells Drilled

Total gas well completions for Western Canada in 2009 collapsed in comparison to previous years. Total gas wells drilled for 2009 set a 10-year low at 5,082 compared to 12,361 the year before, as shown in the graph on the following page. This decline is largely due to the depressed price of natural gas.

For most of the past decade, in both Canada and the US, increased drilling was needed just to sustain production levels. For the US, this trend came to an end in 2009 when production increased despite a steep drop in the number of wells drilled (down 44% from 2008 levels). The graph on the following page clearly illustrates this reversal.



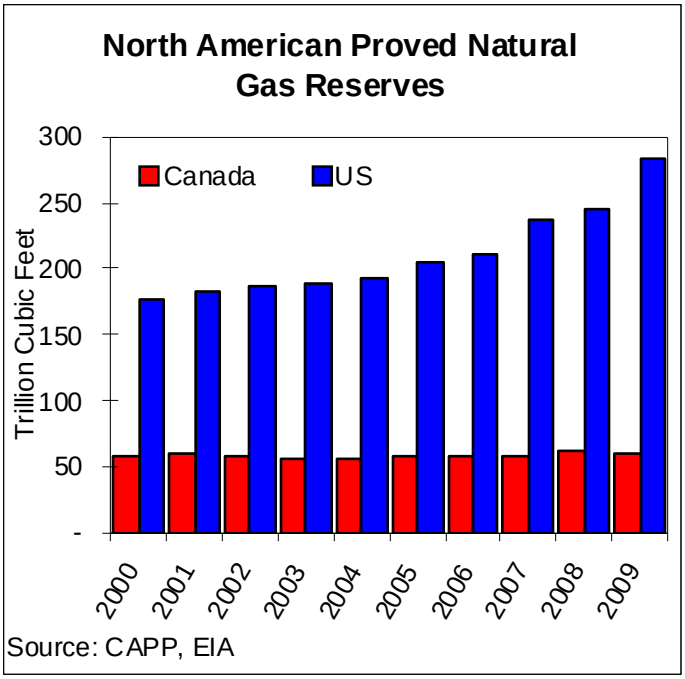
This counter-intuitive result is in part explained by the shift in production from conventional sources to unconventional sources, shale gas in particular. Shale gas drilling tends to be highly productive, especially in the first year, and uses horizontal drilling techniques which have a higher rate of production. In Canada, where shale gas development is still in a nascent stage, dramatic declines in drilling led to equally dramatic declines in production.



Natural Gas Reserves

Proved reserves of natural gas are estimates of the quantities of gas remaining in known, drilled reservoirs, that are economic to produce, and are connected, or can easily be connected, to pipelines and markets. As of year-end 2009, Canadian and US combined reserves totalled nearly 345 Tcf, with 61 Tcf in Canada and 284 Tcf in the US. The graph below shows North American natural gas reserves since 2000. Since 1999, US reserves have increased each year, reversing the previous trend of decline.

Based on North American production of about 26 Tcf per year, the North American reserve-to-production ratio (R/P ratio) is over 13 years. In other words, if no new gas reservoirs are found, US and Canadian reserves would last about 13 years assuming current production rates.[9]



In 2008, Canada posted the largest net reserve addition in over 25 years. Canadian reserves for 2008 jumped 4.3 Tcf (or over 7%). Most of the net reserve additions were attributed to British Columbia and increased optimism surrounding shale plays. This is a concrete example of evidence to support the theory that Canadian gas production will begin to increase

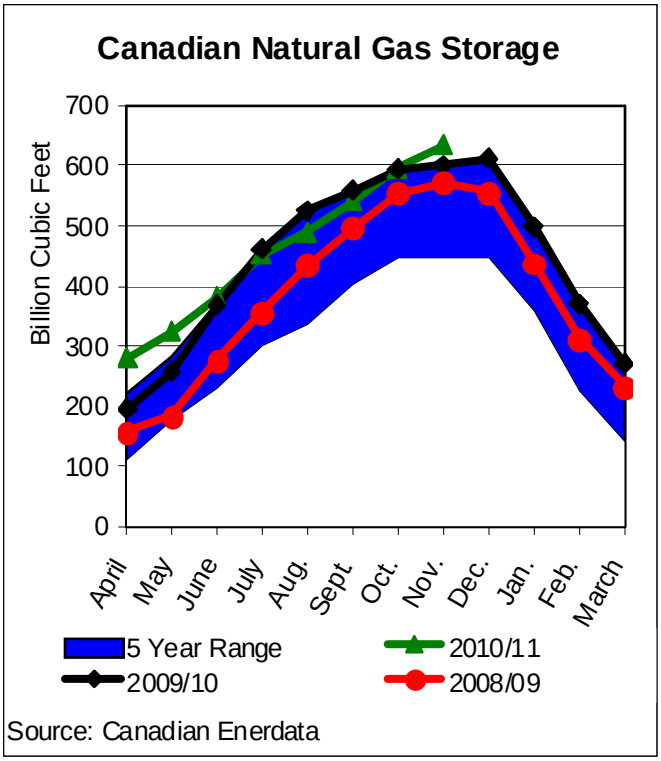
9 New reserves are found every year. Proved reserves change, according to the following formula: proved reserves at start of year + reserve additions (including revisions, whether positive or negative, to previous estimates) during the year - production during the year = proved reserves at end of year.

in the future. Canadian reserves declined about 1.5% in 2009, largely on account of very low prices.

US natural gas reserve growth is primarily due to unconventional natural gas. In the two years the EIA has collected data on shale gas reserves, shale gas reserves increased 50% and now account for 9% of total US reserve estimates.

Natural Gas Storage

Natural gas storage is used to help balance seasonal variations in demand with relatively constant supply. In the spring, summer and fall, when natural gas demand is low, gas is injected into storage. Storage volumes normally peak in the fall. In winter, volumes are drawn down, reaching a low point in the spring.



Source: Canadian Enerdata

Local distribution companies (LDCs) inject gas into storage, and withdraw it in winter to meet peak winter demand loads in the residential and commercial sectors. Storage also allows LDCs to use contracted, long-haul pipeline capacity at relatively stable rates all year.

Producers use storage injections or withdrawals to balance fluctuating production levels with contractual supply obligations. Storage is also used by both buyers and sellers of natural gas to capture price arbitrage opportunities (e.g. inject natural gas into storage when prices are low, and withdraw natural gas and sell it when the price is higher).

Depleted oil or natural gas reservoirs and salt caverns are commonly used to store natural gas. Natural gas storage capacity in Canada is spread across five provinces with the majority in Alberta and Ontario. Western Canadian storage is used primarily for managing supply while storage in eastern Canada is primarily for balancing Ontario's seasonal demand fluctuations.

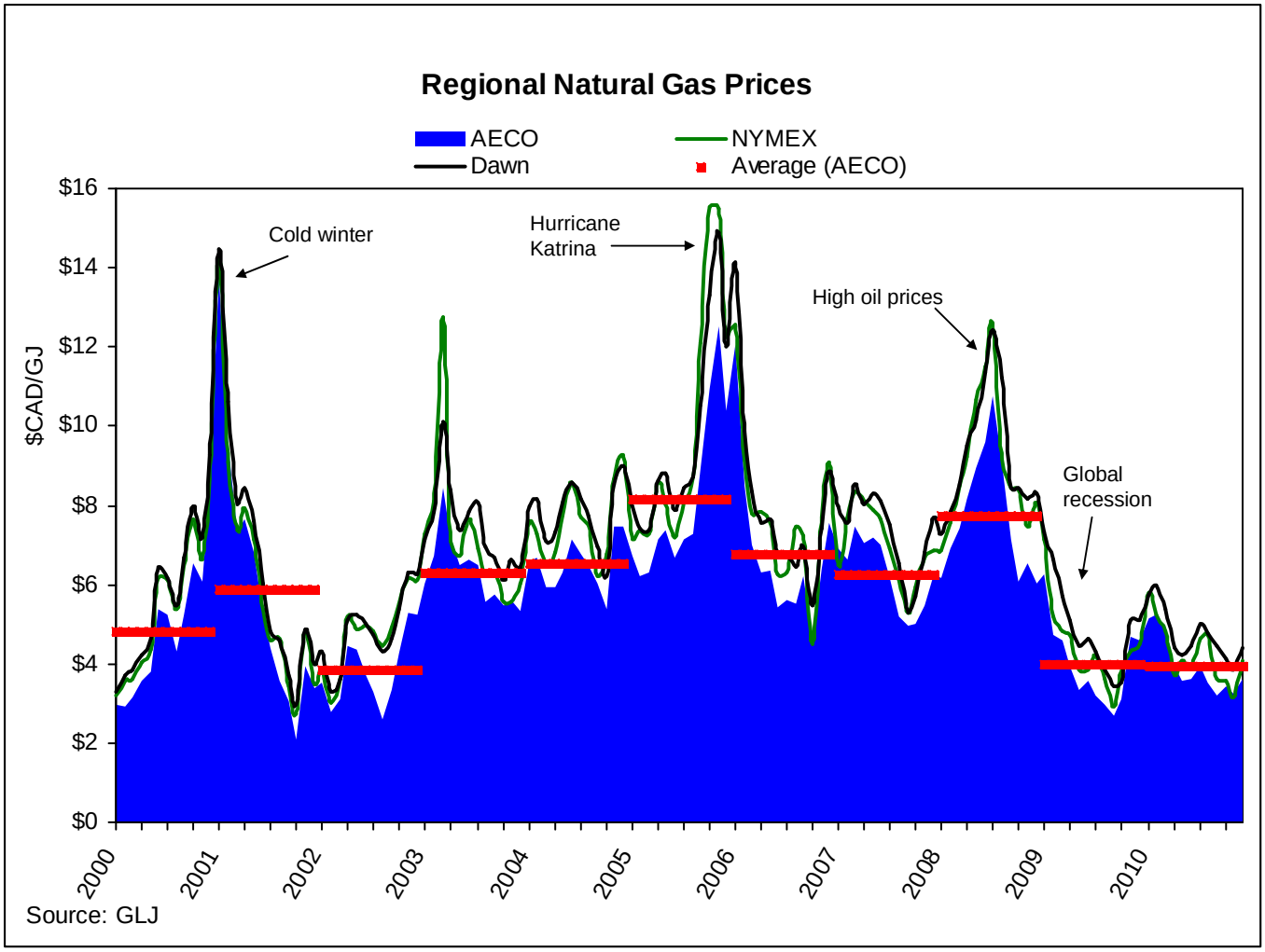
The illustration depicts the 2008/09, 2009/10 and the beginning of the 2010/11 storage seasons, as well as the 5 year maximum and minimum levels for Canada. The recent glut of natural gas on the market sent storage levels in Canada well above previous 5-year maximums. Ballooning storage volumes were attributable to low natural gas prices, reduced industrial demand, and surging US production.

Natural gas in storage strongly influences natural gas prices. Traditionally, there is an inverse relationship between natural gas storage levels and prices. High storage levels promote lower prices, and lower storage levels promote higher prices. It is no coincidence that the record low prices experienced in the last 24 months coincided with record high volumes of natural gas in storage.

Natural Gas Prices

Canadian natural gas prices are unregulated, and change according to buyer and seller perceptions of supply and demand fundamentals. These fundamental factors can be short-term in nature or longer-term (e.g. expected cost of finding new natural gas over the next five years).

As illustrated in the figure on the next page, natural gas prices tend to be very volatile and are prone to price spikes. Many factors are built into the market clearing price for natural gas, including expectations, supply and demand. In the short term, there are also major shocks that can cause natural gas prices to spike, such as cold winters, hurricane's disrupting supply (e.g. hurricane Katrina), exceptionally high oil prices (e.g. gas is a substitute), or most recently the global economic recession.

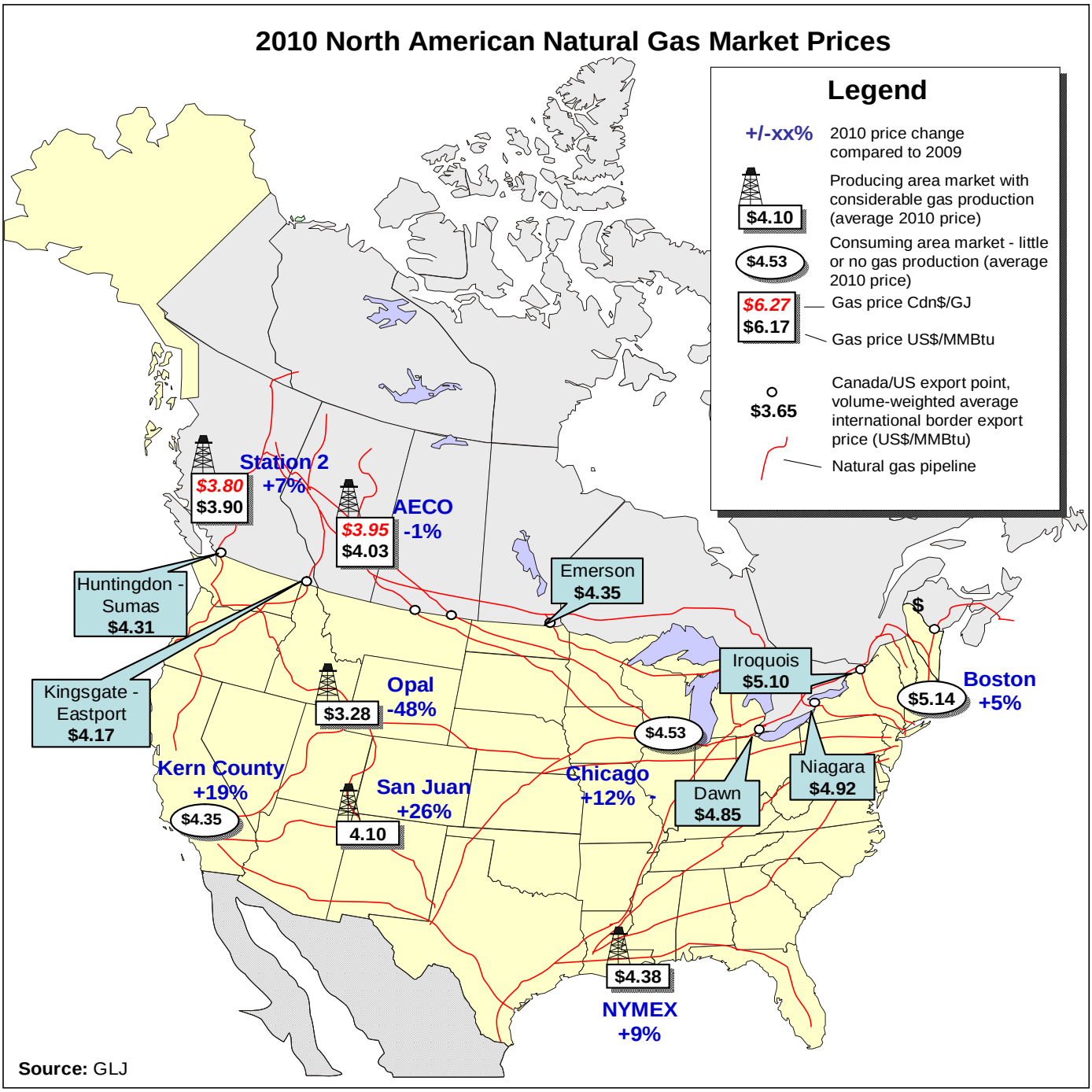


As a consequence of reduced natural gas demand (due to the economic recession), plummeting oil prices and surging shale gas production; natural gas prices collapsed in the summer of 2009. Natural gas prices plunged to record lows of CAD $3/GJ in the fall of 2009, down considerably from the CAD$11/GJ experienced during the summer 2008. Canadian natural gas prices in 2010 remained low and fluctuated in the $3–$6/GJ range. The graph also clearly shows how regional natural gas prices track each other, with differences in price primarily a reflection of transportation costs, and whether an area is a producing area which "exports" gas (low prices) or a non-producing area which must "import" gas from far away (high prices).

The map on the following page provides average annual natural gas prices at various producing basins, market hubs, consumption markets and export points in North America. Prices are simple 12-month averages. Average annual AECO natural gas prices were virtually unchanged between 2009 and 2010, at about $3.95/GJ.

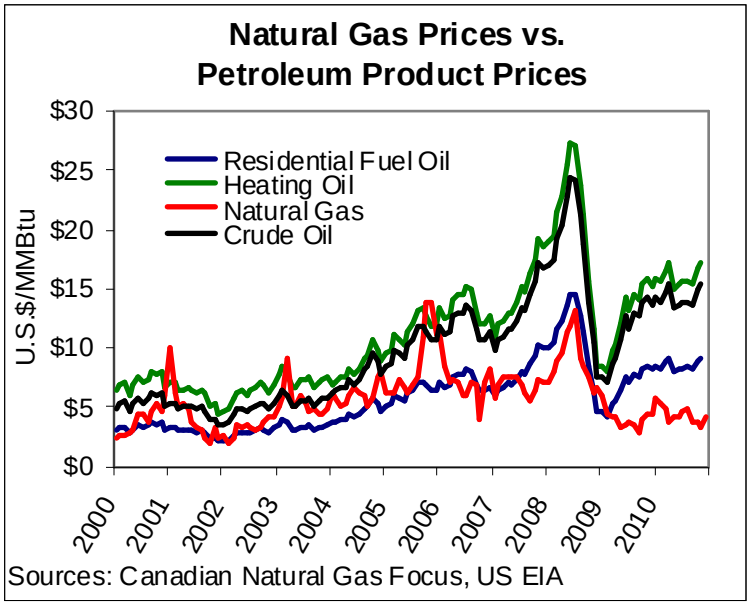
Prices in 2009 and 2010 were low both in absolute terms, and also relative to crude oil prices. The low natural gas prices can be attributed to both the global economic downturn (lower demand) and also the lagged effect of last year's drilling and production increases in the US (higher supply).

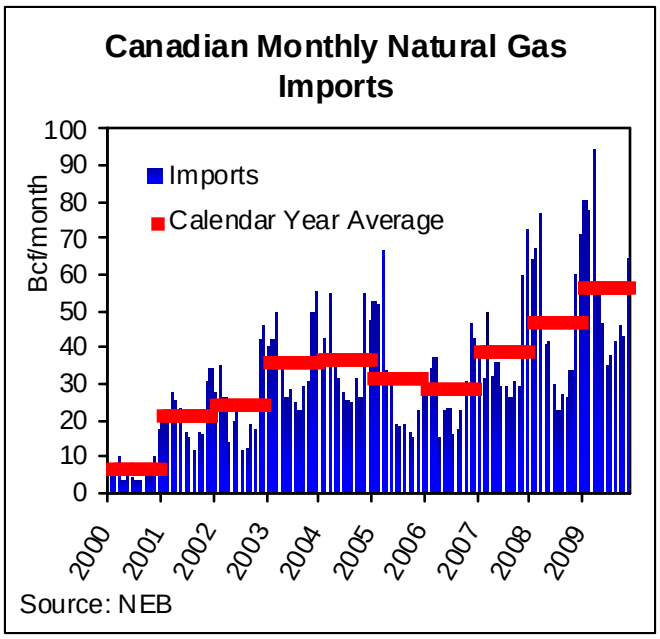
North American natural gas prices were historically strongly influenced by world crude oil prices and North American petroleum product prices. For years, North American natural gas prices (e.g., the NYMEX Henry Hub price) varied within a price band set on the low end by the price per MMBtu of residual fuel oil, and on the high end by the price per MMBtu of distillate. The relationship held on account of major industrial consumers being able to switch fuels on relatively short notice.



This price relationship was relatively robust through to about 2006. However, natural gas and oil have decoupled. Surging oil prices, combined with abundant North American natural gas supplies, and resultant low prices, have kept natural gas prices well below residual fuel oil prices in recent years. The decoupling of oil products and natural gas prices suggests that all industrial consumers who are able to switch to natural gas have already done so. Furthermore, while oil products are priced on a global market, natural gas is still predominantly a continental commodity.

The expectation that oil and gas prices will remain decoupled is fuelling industry efforts to promote the use of natural gas as a cheaper and environmentally friendly alternative for transportation.





Natural Gas Imports, Exports and Revenues

Canada produces natural gas in excess of what is required for domestic consumption. Canada exports about 63% of its gas production, all of which goes to the US. In 2009, 87% of natural gas imported into the US came from Canada.

The table below summarizes Canadian natural gas imports and exports for 2008 and 2009. In 2009, Canadian gas export volumes declined by 11%. Export prices and revenues fell much harder, down 47% and 53% respectively. The decline in export volume was the direct result of falling Canadian natural gas production. As production falls, exports tend to fall, rather than domestic consumption of gas. The resulting drop in natural gas export revenues led to a major decline in Canada's trade balance, as is illustrated in the graph at right.

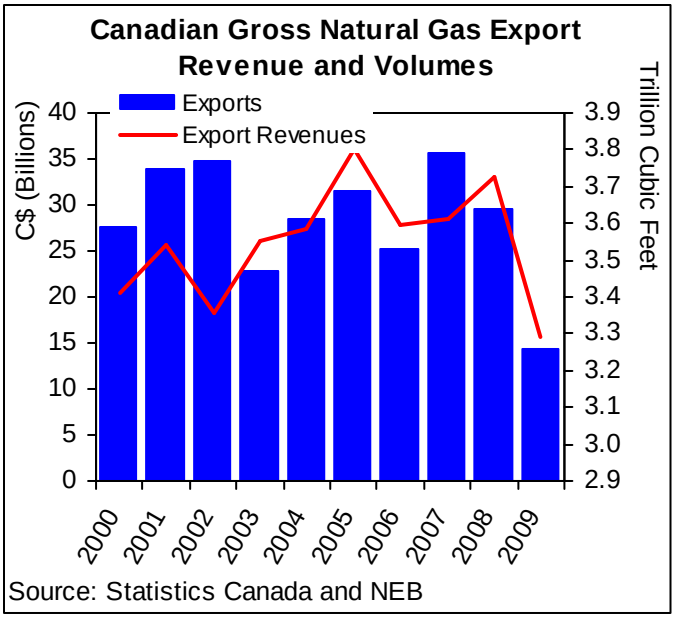
Natural Gas Exports and Imports			
	2008	**2009**	**Change**
Exports (Gross)			
Volume (Tcf)	3.6	3.3	-11%
Avg. Export Price (C$/GJ)	$8.41	$4.42	-47%
Export Revenue (billion)	$33.1	$15.5	-53%
Imports (Gross)			
Volume (Bcf)	562	702	25%
Avg. Import Price (C$/GJ)	$8.59	$4.85	-44%
Import Expense (billion)	$5.17	$3.63	-30%
Net Exports			
Volume (Bcf)	3,083	2,554	-17%
Net Export Revenue (billion)	$27.9	$11.9	-57%

Source: NEB, Statistics Canada

The majority of natural gas imports are from the US. However, in June 2009, Canada received its first LNG cargo at the Canaport terminal in Saint John, New Brunswick.

Imports in 2009 were at a record level of 702 Bcf, a 25% increase over 2008 levels. Some of the gas exported from Canada is re-imported. Natural gas imports have been increasing over time as purchasers in Southern Ontario find it cheaper to access gas from the US.

The graph above highlights both the volatility of imports and their seasonal pattern. Natural gas imports typically double during the colder months to meet peak Ontario and Quebec heating demands. The graph also illustrates Canada's increasing reliance on US imports.



Review of 2009 – Petroleum Products Market

Market Structure

Canadian petroleum product prices are essentially set in a global market. For example, Canadian wholesale gasoline prices are driven by US benchmark prices, such as the New York Harbour price. These US benchmark prices reflect the international crude oil price and such factors as seasonal demand and inventory levels. Canadian wholesale prices must remain competitive with these US benchmark prices. This is because if Canadian refiners' prices (for products) are lower, products will flow out of the country. If refiners' prices are higher, marketers will import lower priced products. The price of crude generally drives the prices of refined petroleum products. Despite this, crude oil and petroleum product prices can, at times, move in opposite directions.

Petroleum Product Demand

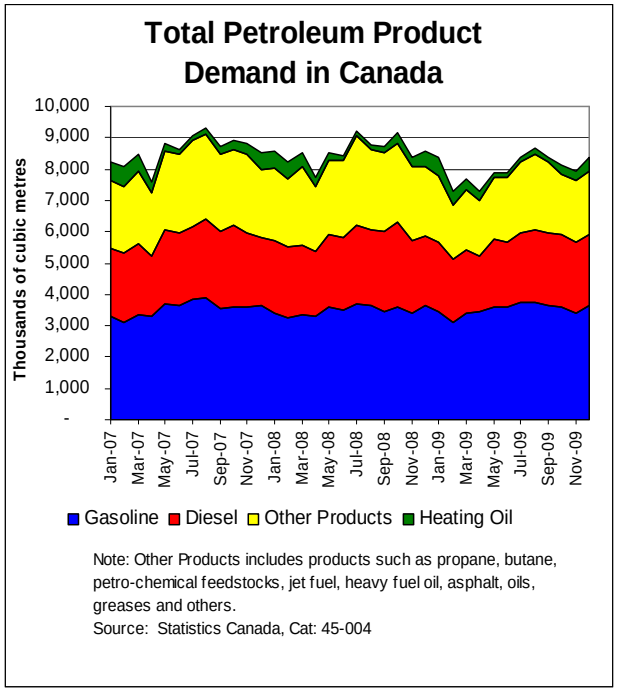
The demand for refined petroleum products (gasoline, diesel, furnace oil, and other products) in Canada fluctuates along with seasonal demand (e.g. increased demand for gasoline during the summer, more heating oil used in winter).

Demand for refined products in Canada fell in 2008 and in 2009, with the worldwide economic slowdown. In 2009, total sales declined by 6.5 billion litres (40.6 million barrels) from the previous year, to 96.6 billion litres (607.2 million barrels).

Gasoline

In 2009, Canadians consumed 42.3 billion litres (266 million barrels) of gasoline, an increase of 0.6 billion litres (3.5 million barrels) from 2008. In 2008, gasoline consumption had dropped by more than 0.5 billion litres.

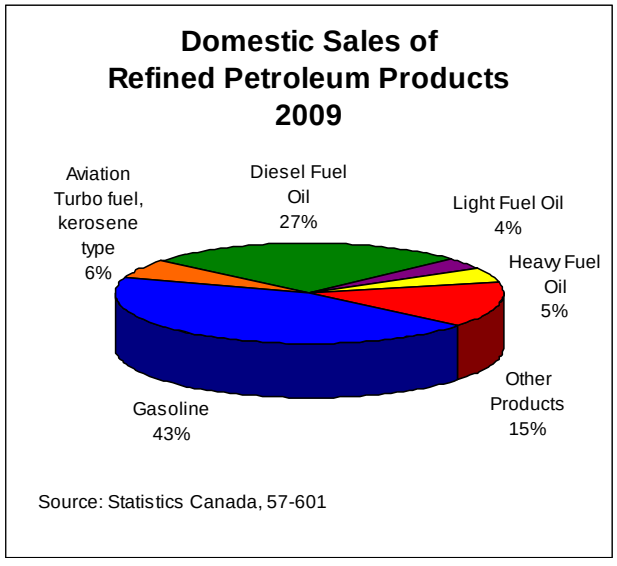
Demand for gasoline dropped in the latter part of 2008 and during the first quarter of 2009 as a result of the economic slowdown. Demand gradually shifted upward, with the traditional increase in demand for gasoline during the summer driving season. By year-end, gasoline annual sales had increased back to the pre-2008 levels.



The Ontario market accounts for 39% of motor gasoline sales in Canada, followed by Québec (21%), Alberta (13%), British Columbia (11%), and Atlantic Canada (7%).

Diesel

Domestic sales of diesel fuel in 2009 were 26.0 billion litres (163.5 million barrels), 8% lower than the year before. Increased diesel demand in 2007 and 2008 reflected strong



growth in the Canadian economy and a growing proportion of diesel-powered vehicles in the fleet. Most of the growth was attributed to increased diesel use in the agricultural, mining and energy sectors of Western Canada. However, in 2009 the 7-year upward trend in diesel consumption ended, as a result of the recession.

In 2009, about 49% of the diesel sales occurred in Western provinces and territories, followed by Ontario (25%), Quebec (18%) and Atlantic Canada (8%).

Light Fuel Oil

Light fuel oil, also called heating oil or furnace oil, represents less than 4% of total petroleum product demand in Canada. Demand for light fuel oil, totalled 3.4 billion litres in 2009, 0.4 billion litres or 10% below 2008. This mainly reflects the loss of share to natural gas and electricity in the space heating markets of Ontario and Quebec. Since 2003, demand for light fuel oil has dropped by more than 35%.

Approximately 10% of Canadian homes use light fuel oil for heat. Heating oil sales are concentrated in Eastern Canada, with Atlantic Canada accounting for about 39% of domestic sales, Quebec at 32%, Ontario at 24% and the rest of Canada at 5% in 2008.

Atlantic Canada has the greatest dependence on oil for heating, with just over half of all homes using fuel oil to meet at least a portion of their heating needs. Prince Edward Island is by far the most dependent, with close to 85% of all households using heating oil. Despite the small percentage of households in Quebec and Ontario using heating oil to meet their space heating needs, heating oil sales in these two provinces represents more than half of Canada's fuel oil consumption, due to the size of the markets.

In Western Canada, natural gas is the dominant fuel for home heating. Only minimal volumes of light fuel oil are consumed in the prairies, and it accounts for only about 3% of the home heating market in British Columbia.

Other Refined Petroleum Products

Other refined petroleum products include heavy fuel oils (HFO), jet fuel, asphalt, petrochemical feedstocks, coke, liquid petroleum gases (LPGs), lube oil and greases. In 2009, these accounted for about 36% of domestic petroleum product sales in Canada.

HFO demand in 2009 dropped by 23% (1.5 billion litres) to 4.9 billion litres. This represents 6% of total Canadian petroleum product demand. HFO is used by the industrial sector, for marine transportation, and for electricity generation.

In 2009, Quebec accounted for 41% of HFO demand and the Atlantic provinces 27%. Only about 32% of HFO demand comes from Ontario and Western Canada, as industries in these regions have more extensive pipeline access to Western Canadian natural gas supply.

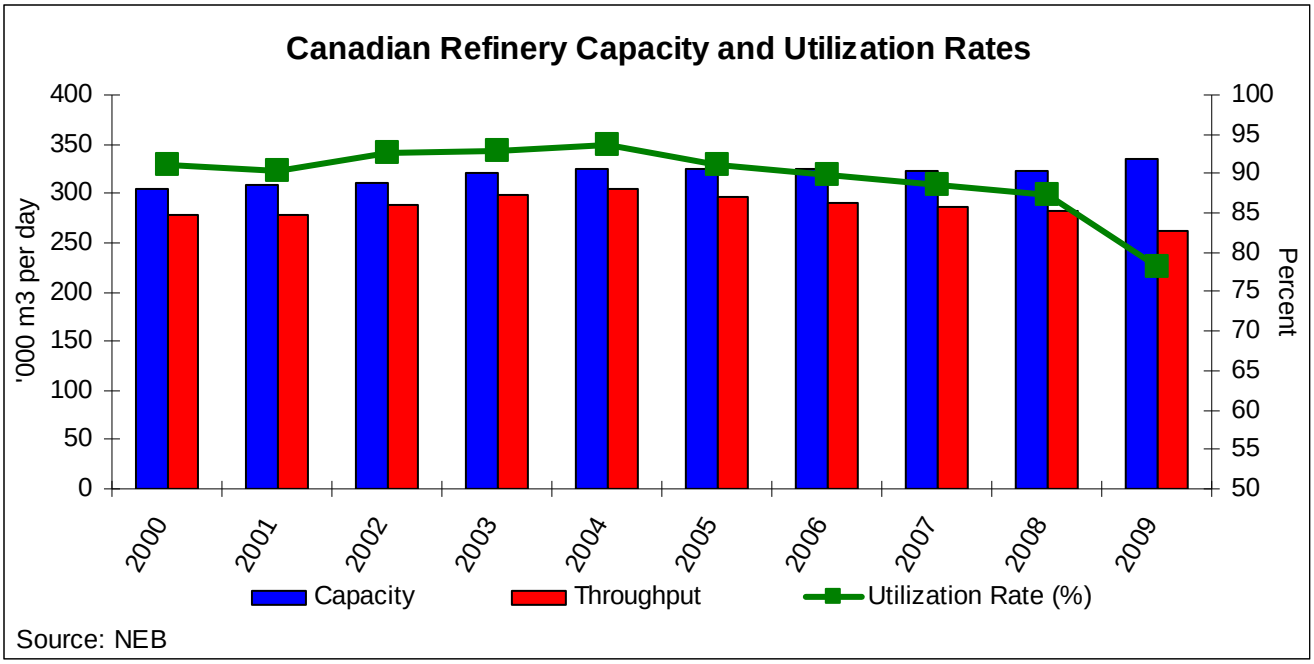
As the other refined products are usually relatively low volume specialty products with few substitutes, their demand is somewhat insensitive to the price of crude oil. However, consumption is not immune to the state of the economy, and demand for these products fell during this past recession.

Supply Overview

Petroleum products are produced by refining crude oil. In 2009, 11 companies operated refineries in Canada. Only Imperial Oil, Shell and Suncor Energy (Suncor and Petro-Canada merged in 2009) operate more than one refinery and market products nationwide. Other refiners generally operate a single refinery and market products in a particular region.

Regional refiners include Irving Oil (New Brunswick), North Atlantic Refining (Newfoundland and Labrador) and Ultramar (Quebec) in the east and Federated Co-op (Saskatchewan), Husky and Chevron (British Columbia) in the West.

Of the 19 refineries in Canada, 16 manufacture the full range of petroleum products. Husky's facility in Lloydminster, Alberta, and the Moose Jaw Asphalt plant in Moose Jaw, Saskatchewan, are primarily asphalt plants with limited production of other products. The Nova Chemicals facility in Sarnia, Ontario, is a petrochemical plant that also produces some distillate products.



There are three main refining centres in Canada (Edmonton, Sarnia and Montreal) but most provinces have at least one refinery. The exceptions are Manitoba and Prince Edward Island. Also, none of the three territories have refining capacity.

It is important to examine refining capacity and refinery utilization rates, as this date provides insight on the economics of building new refineries, and the state of petroleum product competition. Overall, while Canadian refinery capacity has increased slightly over the last decade – despite the closure of the Petro-Canada refinery in Ontario 2005 – the utilization rates has been dropping steadily since 2004. Utilization rates declined more significantly in 2009 because of lower demand for oil products, poor refining economics stemming from the economic downturn, and unscheduled shut-downs.

Regional Refinery Utilization Rates

The figure above shows Canadian refinery capacity and utilization rates. Based on weekly crude oil runs as reported to the National Energy Board, the Canadian refining industry typically operates at approximately 90% of capacity. However, in 2008 the industry operated at an average of 87% capacity. This decreased again in 2009 to 78% – the lowest refinery utilization rate in a decade. Essentially, low petroleum product demand due to the economic downturn and poor refinery economics resulted in lower utilization.

In 2009, Atlantic Canada's utilization rates remained above the Canada average, in part due to continued exports to the US and to other Canadian provinces. However, refinery utilization rates in Western Canada dipped below 65% in 2Q09. This was the result of a number of refinery outages due to planned maintenance and unplanned shut-downs as well as upgrader problems, which interrupted crude supply to oil refineries.

With increasingly complex refineries, unplanned shutdowns have become more common than in the past few years – particularly in Western Canada. A single refinery outage can lead to a significant decrease in local petroleum product supply due to the geographically diverse nature of the country and the limited number of refineries in some regions.

Petroleum Product Inventory Levels

Over the past decades refiners have been rationalizing their operations in order to reduce costs and improve rates of return. A key element of this process has been the reduction of inventory levels to the minimum required to maintain normal operations.

To ensure secure supplies and distribution of petroleum products, refiners and marketers maintain inventories of the various products in strategic locations throughout the distribution

chain. If supplies of imported or domestic crude oil are interrupted for any reason, or if the product distribution system fails, companies can rely on commercial inventories to meet short-term needs while alternate arrangements are being made.

Inventory levels for some products, such as gasoline and light fuel oil, fluctuate significantly over the year. Demand for these products is very seasonal and at its peak can exceed the production capacity of refineries. Therefore, refiners anticipate peak consumption periods and build inventories in advance. Gasoline inventories increase during the first quarter of the year and are drawn down during the summer months to supplement refinery production. Light fuel oil stocks grow during the fall and are drawn during the coldest months of winter when demand is at its highest level.

Refiners also build up inventories of all products in advance of scheduled refinery maintenance (called turnarounds). Turnarounds can vary in frequency from annually to once every few years, and sometimes require the refinery to be completely shut down for a period of several weeks. Refiners prepare by building up product stocks that can be used during the turnaround. Canadian refiners typically maintain 21 to 26 days of gasoline and diesel supplies.

Petroleum Product Trade

Canadian production of gasoline, diesel, and other petroleum products, as well as domestic sales of those products, fluctuates with the seasons. Canadian production has historically been substantially higher than consumption. However at times, refinery down-time and high demand require imports, particularly gasoline.

Canadian Petroleum Product Regions

Canada has four distinct supply/demand regions for petroleum products:

1) Atlantic Canada,
2) Quebec,
3) Ontario and
4) Western Canada.

At times, product imports, exports and inter-regional transfers play a significant role in balancing supply and demand in each of these regions.

Regional Imports and Exports (Thousands of cubic metres)

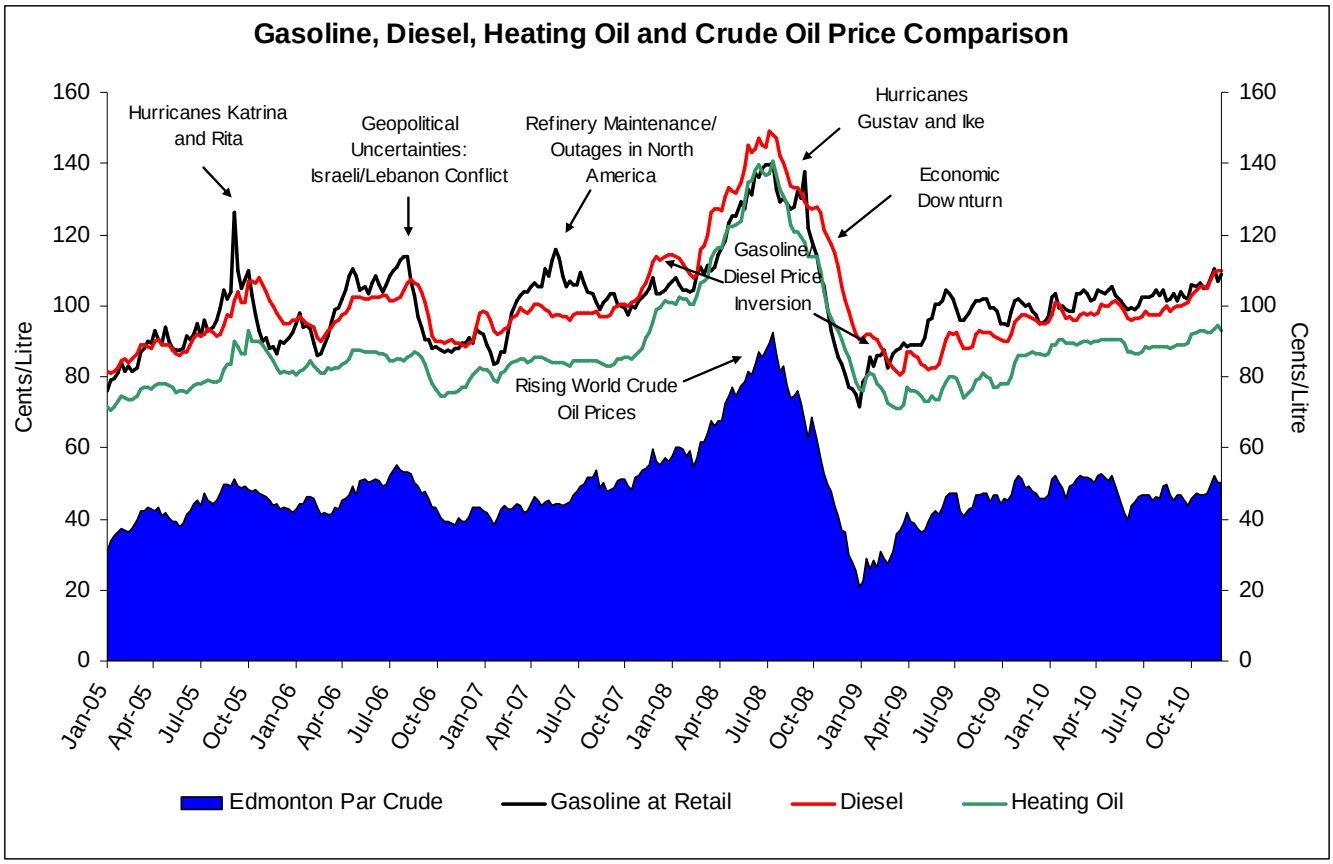
2009	Gasoline	Distillates*
Western Canada		
Net Production	12,580	13,196
Domestic Sales	14,141	12,862
Net Imports	1,185	- 587**
Net Inter-Regional Transfers	- 57**	- 316**
Ontario		
Net Production	10,182	5,666
Domestic Sales	16,354	7,343
Net Imports	478	- 564**
Net Inter-Regional Transfers	4,987	2,097
Eastern Canada		
Net Production	20,618	17,009
Domestic Sales	11,824	9,220
Net Imports	- 4,244**	- 5,908**
Net Inter-Regional Transfers	- 4,929**	- 1,782**
Canada		
Net Production	43,379	35,871
Domestic Sales	42,319	29,425
Net Imports	- 2,582**	- 7,059**

Notes: * Includes diesel and light fuel oil
**These numbers indicate the movement of petroleum products leaving the province/region.
Source: Statistics Canada

Canada both imports and exports petroleum products. Although production has historically been substantially higher than consumption, rising domestic demand now means that imports are more often required in order to balance domestic markets.

Atlantic Canada

Canada exports significant volumes of gasoline, primarily to the US eastern seaboard, from refineries in Atlantic Canada. In fact, in 2008, 65% of the products manufactured in Atlantic Canada were exported, accounting for over 77% of Canada's total exports of refined petroleum products. Atlantic Canadian refiners have been very successful in marketing their ultra-low sulphur products into the US In 2008, Irving Oil announced plans for a new petroleum refinery, the Eider Rock project, that could process up to 300,000 barrels of crude oil per day. However, in July 2009, Irving Oil and its partner BP announced that the proposed new refinery would be postponed.



In addition to being a large exporter of petroleum products to the US, Atlantic Canada also has good access to petroleum product imports. Domestic refiners must thus compete with supplies from the Northeastern US and Europe.

Quebec/Ontario Region

The Quebec and Ontario markets are becoming increasingly integrated with significant Quebec refined product being transported to Toronto via the Trans-Northern pipeline. Quebec also serves as a gateway to Ontario for imported products.

Western Canada

In Western Canada the supply and demand balance for petroleum products has become increasingly tight because much of Western Canada is landlocked, there is limited access to supplies from other regions. Refineries had been operating at near full capacity for several years. However, supply constraints from planned turnarounds and unplanned refinery maintenance and closures resulted in the region becoming a net importer of gasoline and distillates in 2007 and 2008 and of gasoline in 2009.

Petroleum Product Prices

Canadian gasoline prices in 2009 were less volatile than in 2008, averaging 95 cents a litre. This was 19 cents below 2008, when prices averaged $1.14 per litre, due to strong gasoline demand and record high crude prices. These factors resulted in retail prices hitting a record high of $1.40 in mid-July 2008. However, this was soon followed by a sharp downswing as crude prices dropped and by the end of 2008, gasoline prices had bottomed to 72 cents a litre.

Diesel fuel prices averaged $1.25 per litre in 2008, an increase of 25 cents per litre compared to 2007. As with gasoline, diesel prices rose significantly to reach an all-time high of $1.49 per litre in mid-July, and then dropped steadily until the end of the year. In 2009, after starting the year in a downswing, diesel prices averaged 90 cents per litre. Atypically, from September 2007 to February 2009, diesel prices had risen above gasoline prices due to strong world demand growth for diesel vis-à-vis other petroleum products. However, this situation was later reversed with the decline in economic activity and the resulting effect in the construction, agricultural and transportation sectors. Diesel prices

dropped and stayed below gasoline prices for the remainder of 2009.

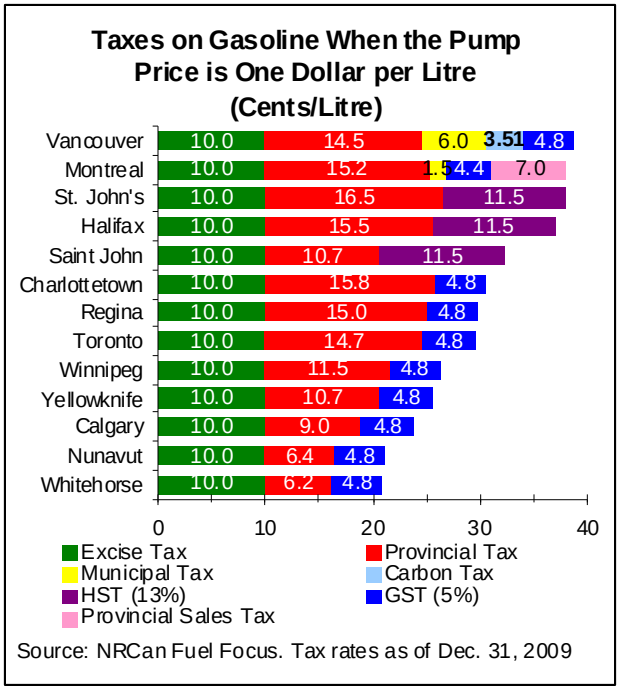
Current and historical prices for gasoline and diesel are available on NRCan's FuelFocus Web site at www.fuelfocus.nrcan.gc.ca.

Consumption Taxes on Petroleum Products

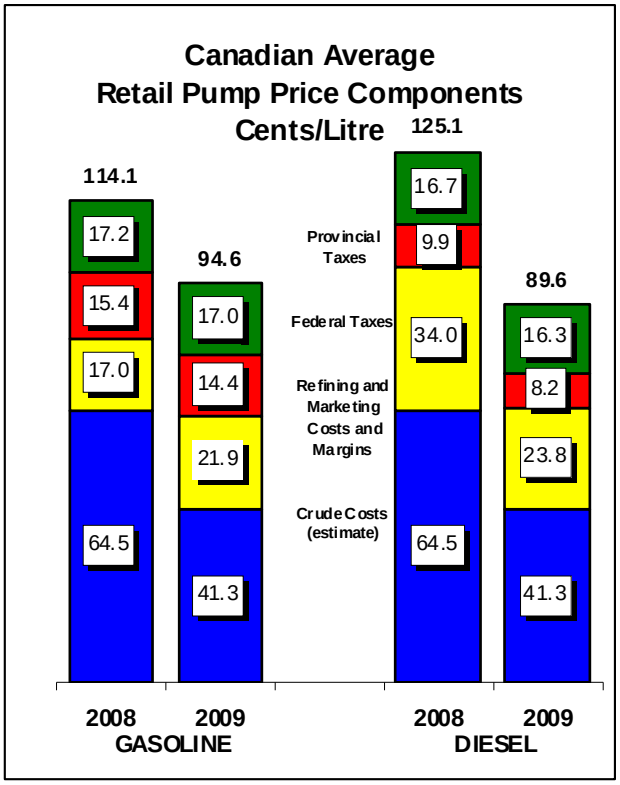
An important element of the gasoline and diesel retail pump prices is the tax component. Depending on the location, federal, provincial and, in some cases, municipal and carbon taxes apply on these products.

There were some significant changes in petroleum product consumption taxes in 2008 and 2009. Federal excise taxes on gasoline and diesel remained unchanged at 10 cents and 4 cents a litre, respectively. The other component of the federal tax, the Goods and Service Tax (GST) and, by extension the Harmonized Sales Tax (HST)[10], was reduced on January 1, 2008, by 1% to 5% and 13%, respectively. (The federal portion of the HST is the same for all provinces.)

On July 1, 2008, British Columbia introduced a carbon tax applicable on all petroleum products used to produce energy and heat. B.C. is the first province to have a carbon tax, which is a consumer tax, payable at time of purchase. The carbon tax rate was initially set on a carbon dioxide equivalent value of $10 per tonne and will increase by increments of $5 every July 1 until it reaches $30 on July 1, 2012. On July 1, 2008, the carbon tax was 2.34 cents a litre for gasoline and 2.69 cents a litre on diesel and heating oil and on July 1, 2009, increased to 3.51 cents and 4.04 cents a litre, respectively.



Source: NRCan Fuel Focus. Tax rates as of Dec. 31, 2009



The figure to the left provides an overview of the tax component breakdown on a litre of gasoline by centres across Canada based on December 1, 2009 tax rates. A table with all applicable federal, provincial and municipal taxes on petroleum products, including diesel and heating oil, is available in Appendix A.

Petroleum Product Imports, Exports, and Revenues

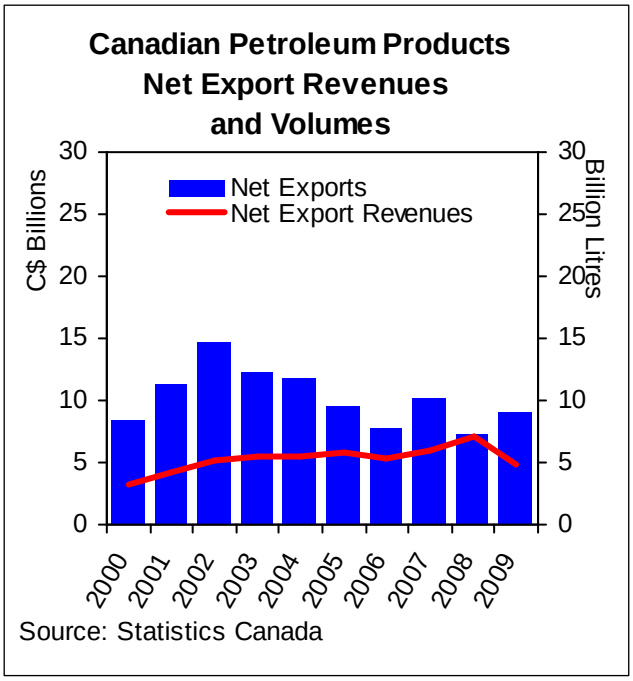
In 2009, Canadian export revenues from finished products were $12 billion, down 33% from 2008, a year when product prices were at record high levels. Import costs totalled about $7 billion, down 33%, for net export revenues of roughly $5 billion. In 2009, exports of finished products dropped by 3% to 24.9 billion litres while imports of finished products into Canada dropped 13% to 15.9 billion litres. In total, net exports of finished products in 2009 were 9.1 billion litres, up from the 7.3 billion litres in 2008.

[10] The GST and the provincial sales tax are harmonized in Newfoundland/Labrador, Nova Scotia and New Brunswick.

Petroleum Products Exports and Imports			
	2008	2009	Change
Exports (Gross)			
Volume (billion litres)	25.6	24.9	-3%
Export Revenue (billion)	$18.0	$12.1	-33%
Imports (Gross)			
Volume (billion litres)	18.3	15.9	-13%
Import Expense (billion)	$10.9	$7.4	-33%
Net Exports			
Volume (billion litres)	7.3	9.1	+25%
Net Export Revenue (billion)	$7.1	$4.8	-32%

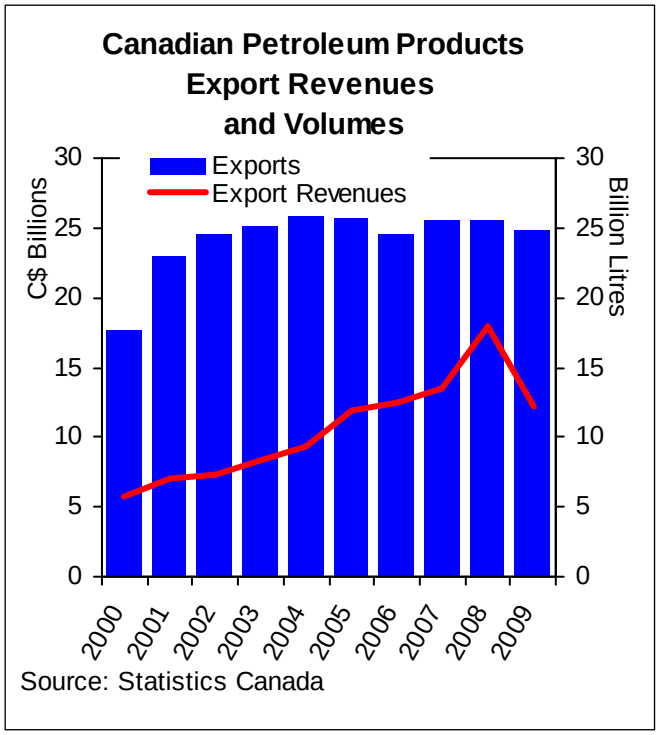
Source: Statistics Canada

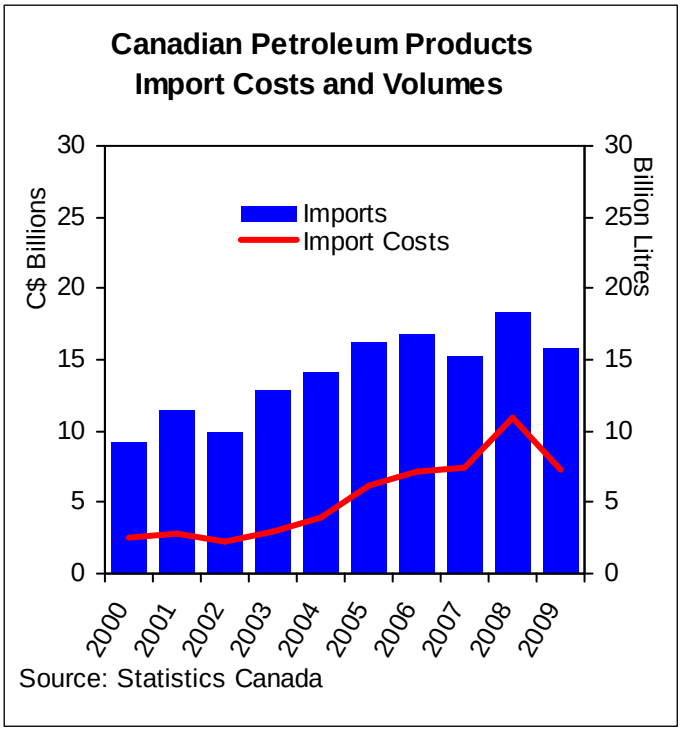
While export revenues have been trending upwards in the past 10 years – with the exception of 2008 and 2009 which saw significant product price swings – exports volumes have typically been in the range of 23 to 26 billion litres per year since 2000. Most of these exports originated in eastern Canada where two refineries produce a significant volume of products destined for Northeastern US markets. However, during the same period, there has been increased reliance on product imports to satisfy demand in Quebec and Ontario. Refinery closures, short term disruptions, new product specifications and



increased demand are some of the contributors to this trend.

Net exports of refined petroleum products were 9.1 billion litres in 2009. However, as both imports and exports have increased over the last decade, net exports remain relatively unchanged when compared to 2000.



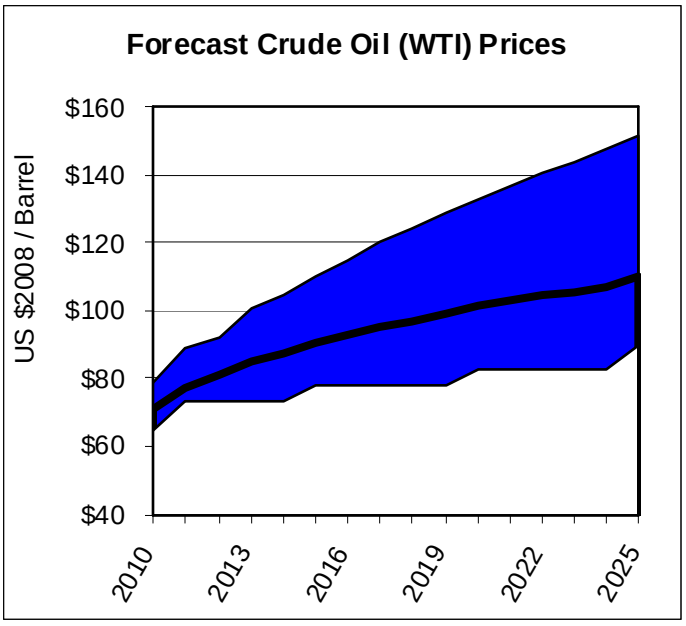


Outlook to 2030

Energy forecasts are useful to help inform policy development. NRCan's Petroleum Resources Branch does not generate its own forecasts; instead, PRB canvasses both publicly available and private industry forecasts, including Ziff Energy Group. However, within NRCan, the Energy Policy Branch does produce an oil and natural gas price outlook as part of its Energy Outlook. Plotted together, these forecasts provide a good sense of market expectations. The graphs depict the range of minimum and maximum forecasts, as well as the average of all forecasts, for crude oil and natural gas prices, production and demand.

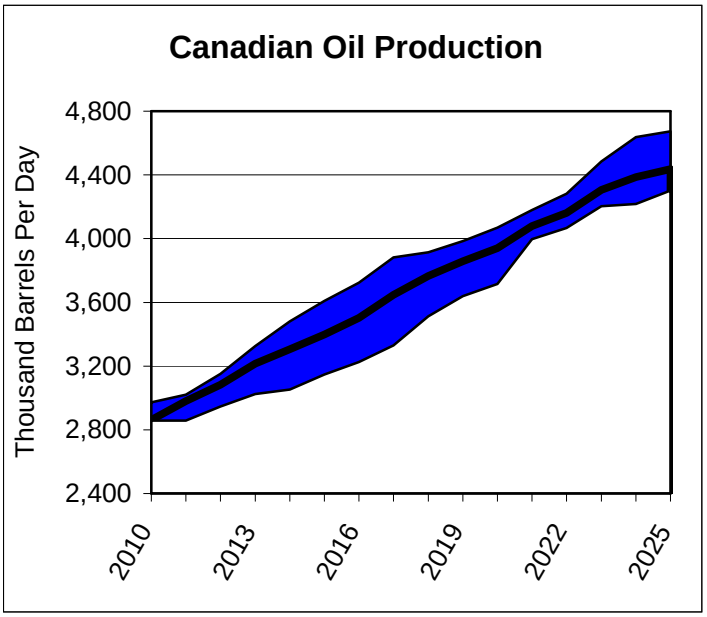
Crude Oil Forecasts

Crude oil prices are widely anticipated to increase over the coming decades. Noteworthy is the fact that crude oil forecasts normally take into account current market conditions and prices are subsequently extrapolated into the future. Given the difficulty of predicting all of the factors which can influence the price of oil, there is no clear consensus on future oil prices.

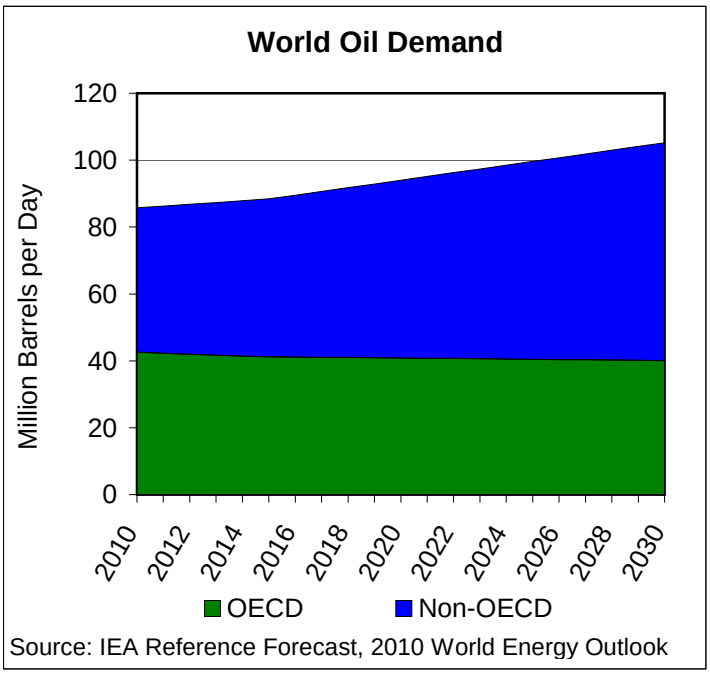


The range of long-term crude price forecasts is shown. These forecasts, the majority of which only go out as far as 2025, reflect a recent view as to the direction of oil prices.

The range of Canadian crude oil production forecasts shows considerable variability. All of the forecasts anticipate that Canada's conventional crude oil production will decline over time, and oil sands production will progressively make up a larger share of production.



Overall, the forecasts point towards rising Canadian crude oil production in the coming years driven by the oil sands.



Source: IEA Reference Forecast, 2010 World Energy Outlook

Of note is the fact that Canada is the only OECD member country with rising crude oil production. The major source of variability in all of the forecasts is the extent to which oil sands production will come online over the coming decades.

Overall, the forecasters expect that Canadian oil sands production could more than double to around 3 mb/d by 2020. By 2025, total Canadian crude oil production could exceed 4.5 mb/d with most production coming from the oil sands.

Canada has a large and growing net surplus of crude oil. The domestic market for oil sands production will grow with increased production. Rising surplus Canadian crude oil production will help meet the demands for oil in the US market, and could be exported to new markets in Asia.

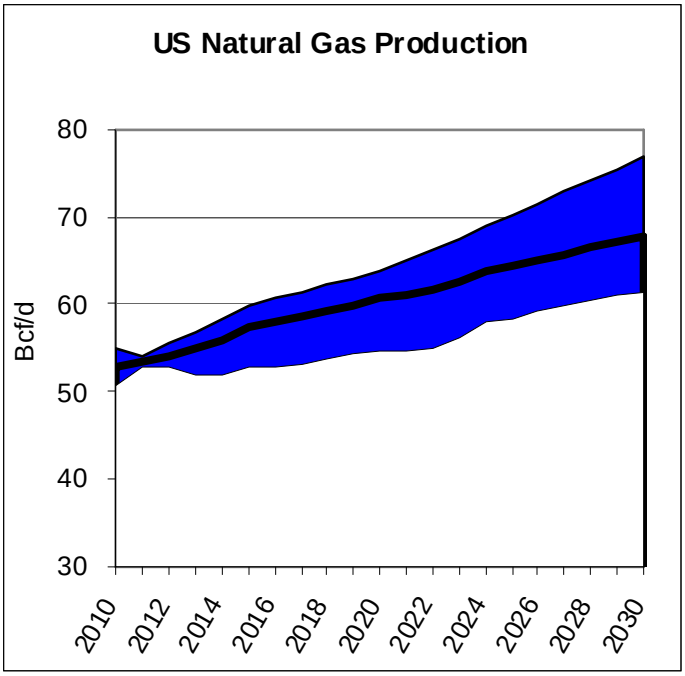
Between 2009 and 2030, the reference forecast shows world oil demand growing by 1% per year, due entirely to demand from Non-OECD countries particularly from Asia. In fact, China and India alone are projected to account for close to two-thirds of the increase in demand.

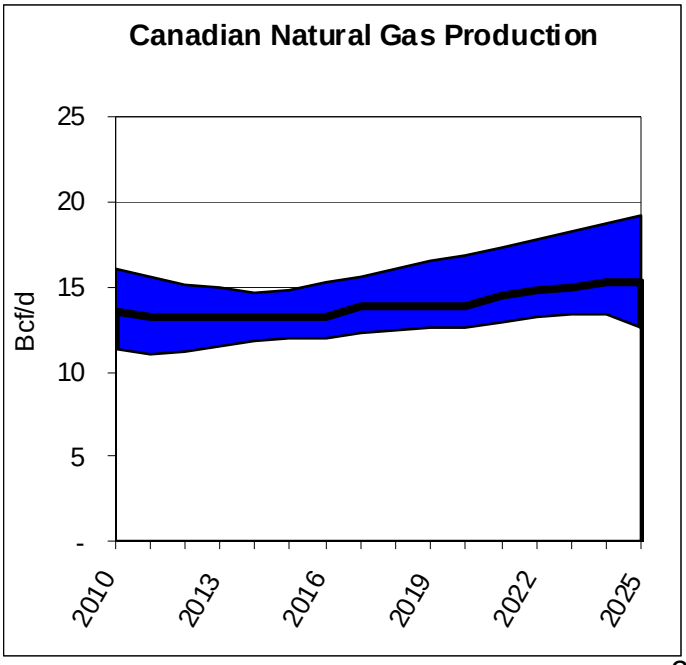
Oil demand from Non-OECD countries, including those in North America, is expected to decline.

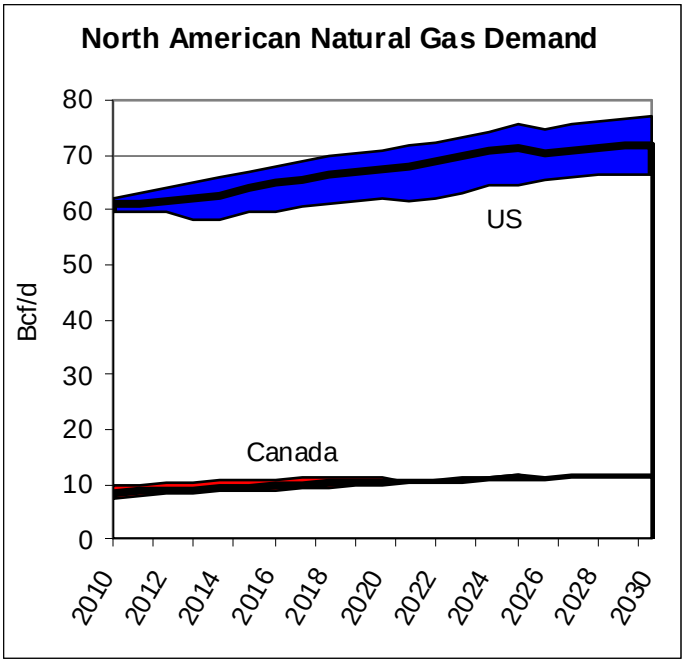
Natural Gas Forecasts

A survey of Canadian natural gas production forecasts, the majority of which only go out as far as 2025, shows considerable variability, particularly in the long run. All forecasts point to declining production in the coming years. With the exception of the NEB's Low Price scenario, most forecasts anticipate Canadian production recovering over the long term. The major source of variability in all forecasts is the extent to which Canadian shale gas production will come online over the coming decades.

Production expectations are more bullish for the US where all surveyed forecasts point to considerably higher production over the long term. Expectations concerning a growing supply reflect increased optimism surrounding shale gas development in the US.

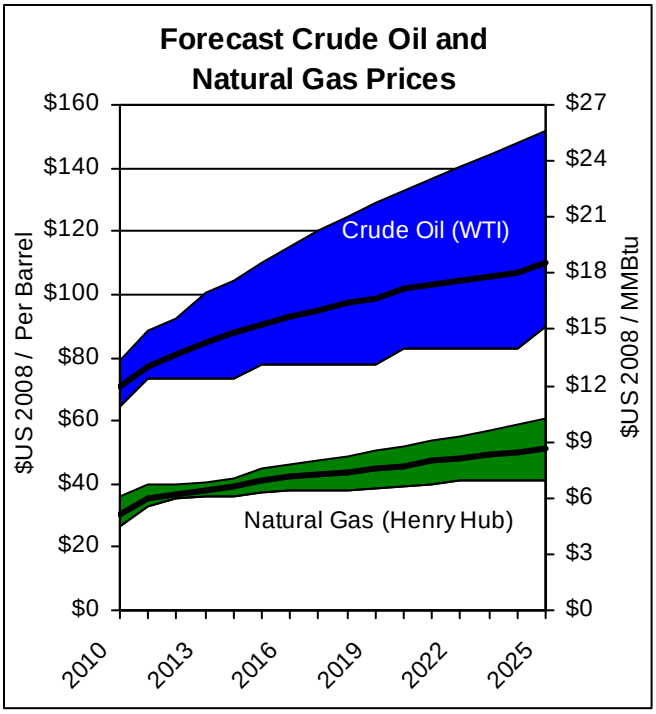






Demand for natural gas is expected to increase over the long term. This reflects a continuing trend that is decades old. Natural gas demand typically increases by about 1 percent per year.

Despite optimism surrounding unconventional gas production, natural gas prices are anticipated to increase over the coming decades. Noteworthy is that prices are also expected to continue trading at a significant discount to oil prices (on an energy content basis). The decoupling of crude oil and natural gas prices that has taken place recently, largely on account of surging shale gas production, is expected to stay for the long term.



Appendix A – Taxes on Petroleum Products

Taxes on Petroleum Products – December 31, 2009
(Cents/Litre)

	Gasoline	Diesel	Propane (motor vehicle)	Furnace Oil/ Natural Gas (for heating)
Excise Tax	10.0	4.0		
Goods and Services Tax	5%	5%	5%	5%
OR : Harmonized Sales Taxes (which applies in NF, NS, NB) (1)	13%	13%	13%	13%
Newfoundland and Labrador	16.5	16.5	7.0	
Prince Edward Island (2)	15.8	19.6		
Nova Scotia	15.5	15.4	7.0	(3)
New Brunswick	10.7	16.9	6.7	
Québec (4)	15.2	16.2		
Quebec Sales Tax	7.5%	7.5%	7.5%	7.5%
Ontario	14.7	14.3	4.3	
Manitoba	11.5	11.5	3.0	
Saskatchewan	15.0	15.0	9.0	
Alberta	9.0	9.0	6.5	
British Columbia (5)	14.5	15.0	2.7	
Additional Carbon Tax	3.51	4.04	2.31	4.04/2.85
Yukon	6.2	7.2		
Northwest Territories (6)	10.7/6.4	9.1		
Nunavut (6)	10.7/6.4	9.1		
Additional Transportation Taxes in Specific Markets (in addition to above-mentioned taxes)				
Montreal (4)	1.5			
Vancouver (5)	6.0	6.0		
Victoria (5)	2.5	2.5		

Notes:

1. In Newfoundland and Labrador, New Brunswick and Nova Scotia, the Goods and Services Tax (GST) and the provincial retail sales taxes are replaced by a single, harmonized value-added tax, the Harmonized Sales Tax (HST), applicable on all petroleum products.
2. Since April 2005, gasoline and diesel taxes in Prince Edward Island are revised on the first day of the month.
3. Nova Scotia has a point of sale tax rebate of the provincial portion of the GST on furnace oil.
4. In Quebec, gasoline, diesel and propane taxes are reduced by varying amounts in certain remote areas and within 20 kilometres of the provincial and US borders. The Quebec provincial retail sales tax (QST) applies to all petroleum products. In Montreal and surrounding municipalities there is an additional an urban tax of 1.5 cents per litre on gasoline.
5. On July 1, 2008, British Columbia (BC) introduced a carbon tax on fuels used to produce energy or heat. In the Greater Vancouver and Victoria areas, there are additional transportation taxes of 6 and 2.5 cents per litre, respectively, on gasoline and diesel. For more information on all fuel taxes in BC, visit the Ministry of Finance Web site: http://www.sbr.gov.bc.ca/business/Consumer_Taxes/consumer_taxes.htm.
6. In the Northwest Territories and Nunavut gasoline is taxed at 6.4 cents per litre in communities not served by a highway system.

Acronyms

kb/d = Thousand Barrels Per Day

mb/d = Million Barrels Per Day

bbl = Billion Barrels

$10^3m^3/d$ = Thousand Cubic Metres Per Day

$10^6m^3/d$ = Million Cubic Metres Per Day

MMcf/d = Million Cubic Feet Per Day

Bcf = Billion Cubic Feet

Tcf = Trillion Cubic Feet

EIA = Energy Information Administration

IEA = International Energy Agency

NEB = National Energy Board

NRCan = Natural Resources Canada

OECD = Organization for Economic Cooperation and Development

OPEC = Organization of Petroleum Exporting Countries

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