



National Energy
Board

Office national
de l'énergie

Energy Briefing Note

Canadian Energy Overview 2010

energy

July 2011

Canada 

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Table of Contents

Foreword	ii
Observations	1
Energy and the Canadian Economy	1
Crude Oil and Petroleum Products	4
Natural Gas	9
Electricity	13
Appendix 1	19
Appendix 2	20

Foreword

The National Energy Board (the NEB or the Board) is an independent federal regulator whose purpose is to promote safety and security, environmental protection and efficient energy infrastructure and markets in the Canadian public interest¹ within the mandate set by Parliament for the regulation of pipelines, energy development, and trade.

The Board's main responsibilities include regulating the construction and operation of interprovincial and international hydrocarbon pipelines, international power lines, and designated interprovincial power lines. Furthermore, the Board regulates the tolls and tariffs for the pipelines under its jurisdiction. With respect to the specific energy commodities, the Board regulates the export of natural gas, oil, natural gas liquids (NGLs) and electricity, and the import of natural gas. Additionally, the Board regulates oil and gas exploration and development on frontier lands and offshore areas not covered by provincial or federal management agreements.

The Board also monitors energy markets, and provides its view of the reasonable foreseeable requirements for energy use in Canada having regard to trends in the discovery of oil and gas.² The Board periodically publishes assessments of Canadian supply and demand of energy and natural gas markets in support of its ongoing market monitoring. These assessments address various aspects of energy markets in Canada. Annually, the Board conducts a review of the previous year's energy markets, entitled *Canadian Energy Overview*. This year's report, *Canadian Energy Overview 2010*, summarizes major developments related to energy in Canada in 2010.

If a party wishes to rely on material from this report in any regulatory proceeding before the NEB, it may submit the material, just as it may submit any public document. Under these circumstances, the submitting party in effect adopts the material and that party could be required to answer questions pertaining to the material.

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1 The public interest is inclusive of all Canadians and refers to a balance of economic, environmental, and social considerations that change as society's values and preferences evolve over time.

2 This activity is undertaken pursuant to the Board's responsibilities under Part VI of the *National Energy Board Act* and the Board's decision in GHR-1-87.

Observations

- The Canadian economy achieved a 3.1 per cent growth rate in Gross Domestic Product (GDP) in 2010.
- Overall, global and North American economic conditions improved in 2010. Global real economic growth was estimated at 3.8 per cent in 2010 and 2.8 per cent in the United States (U.S.). However, there were mixed economic signals during the year related to financial stability in the eurozone³ and economic expansion in the U.S. and China.
- The biggest energy supply story in North America continued to be the development of tight and shale gas resources. In Canada, tight and shale gas production accounted for 36 per cent of total domestic gas production in 2010 compared to 18 per cent in 2000.
- In 2010, North American natural gas prices remained below the yearly average of 2003-2008 gas prices because of the abundance of U.S. supply and decreased Canadian demand. Current gas prices constrained increases in wholesale electricity prices in Canada.
- The average oil price of US\$79.48/bbl (WTI⁴) in 2010 was 28 per cent higher than the average oil price in 2009. Higher oil prices contributed to increased oil sands activity and more oil drilling in low permeability formations of Western Canada. Domestic crude oil production grew by 5.0 per cent and synthetic crude oil production grew by 3.5 per cent in 2010.
- The decline in natural gas production was a result of less drilling in 2009 and 2010 given natural gas price levels, and declining demand for Canadian gas in the U.S.
- Hydro-electricity production declines were related to substantially lower precipitation levels.
- Wind-based electricity generating capacity increased by 21 per cent in 2010 to a total of about 4 000 MW, which accounted for about three per cent of all generating capacity in Canada.
- Decreased electricity production led to lower electricity exports, which traditionally originate from provinces with predominantly hydro-based energy resources. Crude oil exports increased by 6.1 per cent in 2010 and gas exports increased by 0.2 per cent compared to 2009.

Energy and the Canadian Economy

The energy sector accounted for 6.7 per cent of Canada's GDP in 2010, which was about the same as in 2009 (Table 1).

Reflecting a global trend, 2010 marked a year of economic recovery in Canada. Global financial market conditions improved and most commodity prices rebounded during the course of the year. The Canadian economy experienced expansion and favourable employment growth. Increases in consumer and business expenditures contributed to 3.1 per cent growth in real GDP in 2010, compared to a decline of 2.5 per cent in 2009.

3 The economic region formed by those member countries of the European Union that have adopted the euro.

4 West Texas Intermediate

Table 1
Key Statistics on Energy and the Economy

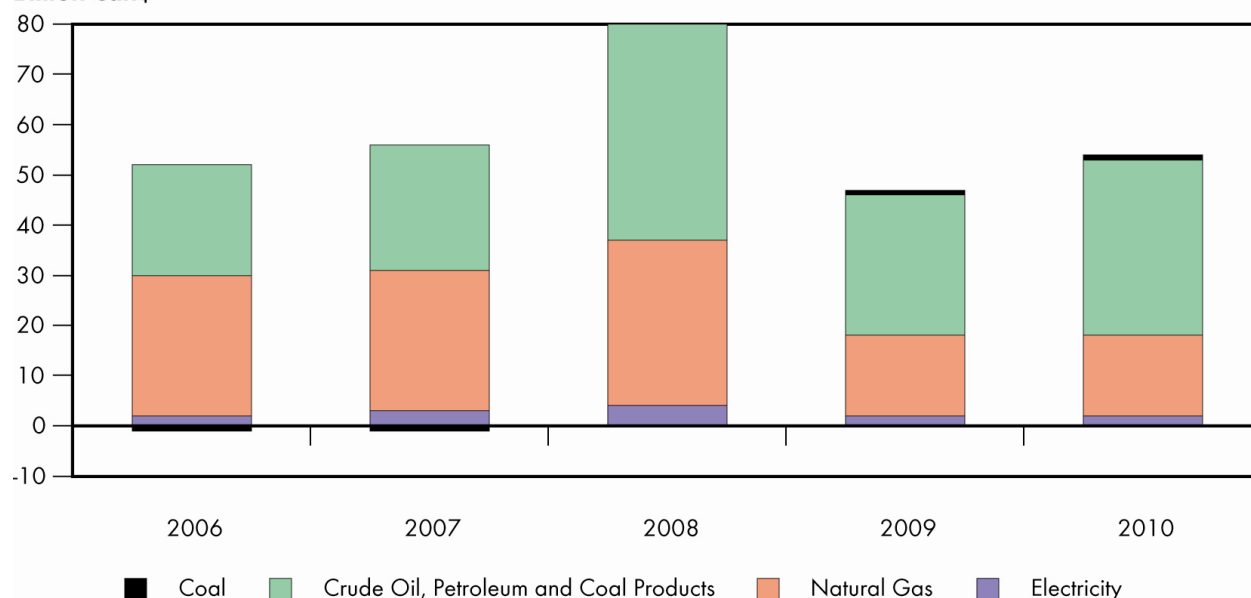
	2009	2010	Difference, 2009-2010
The energy industry's direct contribution to GDP (per cent)	6.7	6.7	0
Annual energy export revenues (Billion \$)	81	94	+13
The energy industry's direct contribution to export revenues (per cent)	22.0	23.2	+1.2
Monthly Average Oil Price (US\$/bbl)	61.95	79.48	+17.53

Sources: Statistics Canada, Energy Information Administration

Canadian energy exports contributed \$94 billion to the economy in 2010, an increase of \$13 billion from 2009. Crude oil prices started to rise as 2010 came to a close.

Figure 1
Net Energy Export Revenues, 2006-2010

Billion Cdn\$



Source: Statistics Canada

In 2010 net energy export revenue increased to about \$53 billion from \$47 billion in 2009, which was a 13 per cent increase (Figure 1). Crude oil, petroleum and coal products contributed 65 per cent of net energy export revenue in 2010, compared to 60 per cent in 2009, and 42 per cent in 2006.

Domestic energy production by coal, petroleum and wind grew in 2010 to contribute to an estimated 0.8 per cent energy production increase. This followed two years of decreasing energy production (Table 2).

Table 2
Domestic Energy Production by Energy Source
 (petajoules)

	2006	2007	2008	2009	2010	% Change, 2009-2010
Petroleum ^(a)	6 908	7 126	6 839	6 785	7 171 ^(b)	5.7%
Natural Gas ^(c)	6 589	6 481	6 395	5 984	5 728	-4.3%
Hydroelectricity	1 258	1 317	1 343	1 307	1 253	-4.1%
Nuclear	1 184	1 098	1 131	1 089	1 088	-0.1%
Coal	1 419	1 506	1 490	1 361	1 468 ^(b)	7.9%
Wind	9	10	14	24	26 ^(b)	8.3%
Other ^(d)	527	584	575	543 ^(b)	500 ^(b)	-7.9%
Total	17 895	18 123	17 786	17 094	17 233	0.8%
Annual % Change	1.8%	1.3%	-1.9%	-3.9%	0.8%	--

(a) Petroleum includes crude oil and gas plant NGLs, upgraded and non-upgraded bitumen and condensate

(b) Estimates

(c) Marketable natural gas

(d) Includes solid wood waste, spent pulping liquor, wood and other fuels for electricity generation

Sources: NEB, Statistics Canada, Natural Resources Canada

Total domestic secondary⁵ energy consumption increased by about one per cent in 2010 mainly due to growth in industrial and transportation use⁶. Residential energy consumption declined by about eight per cent compared to 2009 because of a warmer Canadian winter (Table 3).

Table 3
Domestic Secondary Energy Consumption
 (petajoules)

	2006	2007	2008	2009	2010 ^(a)	% Change, 2009-2010
Residential ^(b)	1 335	1 439	1 461	1 419	1 313	-7.5%
Commercial	1 420	1 475	1 489	1 466	1 364	-7.0%
Industrial ^{(b)(c)}	4 998	5 273	5 061	4 803	4 950	3.1%
Transportation	2 513	2 630	2 630	2 611	2 743	5.1%
Total	10 265	10 817	10 641	10 298	10 370	0.7%
Annual % Change	-0.9%	5.4%	-1.6%	-3.2%	0.7%	

(a) Estimates

(b) Includes biomass (wood and pulping liquor)

(c) Includes producer consumption energy use and non-energy use

Sources: NEB, Statistics Canada

⁵ Energy used by final consumers for residential, agricultural, commercial, industrial and transportation purposes. (Natural Resources Canada website)

⁶ The growth can partly be attributed to economic recovery after the recession in 2009.

Crude Oil and Petroleum Products

World crude oil prices were more stable in 2010 compared to the previous two years. In North America, WTI prices rose from about US\$82/bbl in January to US\$91/bbl in December, with some fluctuations in between. Global crude oil demand increased by 3.3 per cent to 553 million m³/d (87.9 MMb/d) in 2010.

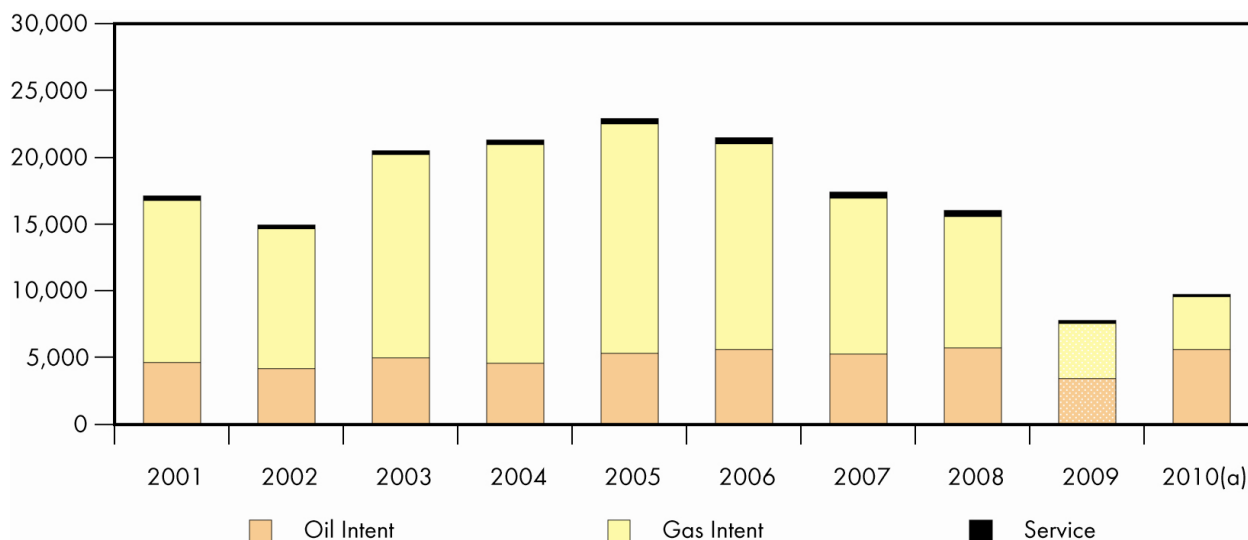
Crude Oil Demand

In Canada, oil demand in 2010 grew from an estimated average of 275 900 m³/d (1.74 MMb/d) to 284 400 m³/d (1.79 MMb/d) or 3.1 per cent from 2009. Ontario and the Atlantic provinces increased their use of both imported and domestic light crude. Quebec decreased its light crude imports and increased the use of domestic light crude over the same period.

Crude Oil Supply

Rising oil prices, low natural gas prices and the success of horizontal drilling and multistage fracturing⁷ have contributed to a resurgence of activity in the conventional oil fields of the Western Canada Sedimentary Basin (WCSB). In 2010, drilling activity was higher than in 2009 with close to 60 per cent of wells (about 5,600 wells) targeting oil and about 40 per cent targeting natural gas, a reversal of the long-term historical trend (Figure 2). Horizontal drilling in western Canada for both oil and gas was at record levels in 2010.

Figure 2
Number of Wells Drilled – Western Canada, 2001-2010



(a) Estimates

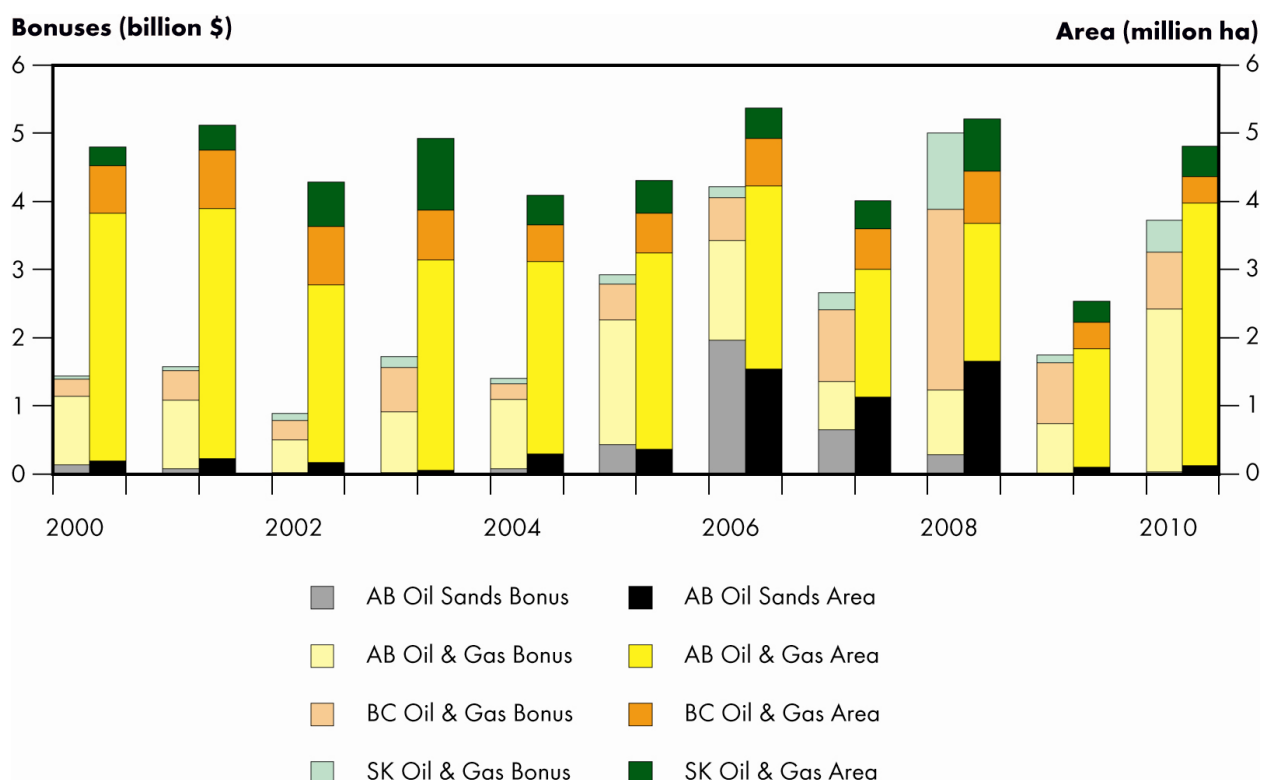
Source: NEB analysis of Divestco Inc. data

⁷ The concept of using horizontal drilling and multistage fracturing to exploit tight shale formations was developed in the U.S. shale gas plays, and has been successfully used in oil shale plays since about 2006. The technology has resulted in sharply higher per well production rates compared with vertical wells [e.g., 7.95 m³/d (50 bbl/d) vs. 0.79 m³/d (5 bbl/d)].

The increased oil activity in 2010 has halted the four to five per cent decline seen in recent years in conventional oil production levels.

Operators spent \$3.7 billion to lease natural gas, oil and oil sands rights in Western Canada in 2010, more than doubling the expenditures in 2009, but still lower than levels reached in 2006 and 2008 (Figure 3). Operators in Alberta increasingly targeted the rights to tight oil, liquids-rich tight gas and shale gas. Even though spending increased, the total area of land leased was close to the average of the past ten years at 4.8 million hectares.

Figure 3
WCSB Oil, Gas and Oil Sands Activity and Rights Expenditures, 2001-2010



Sources: Provincial regulatory agencies

Over \$111 million in work bids were tendered for oil and gas rights for offshore Newfoundland, and over \$110 million in work bids were tendered in the Northwest Territories in 2010.

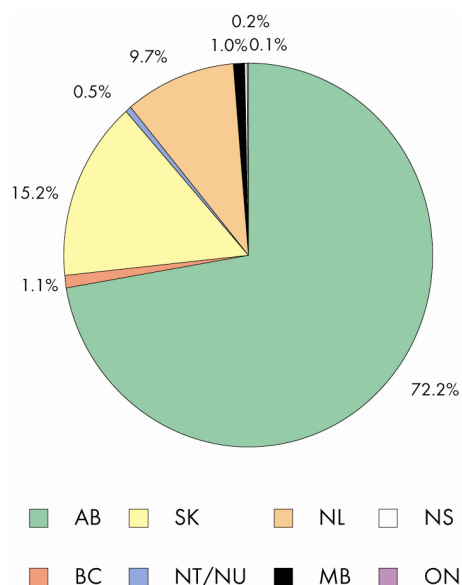
Crude Oil Production

Canadian crude oil production in 2010 averaged an estimated 450 453 m³/d (2.83 MMb/d) which was a 5.0 per cent increase compared to 2009. Estimated production of heavy crude oil increased by 10.2 per cent while that of light crude increased by 2.1 per cent. Canada is the seventh largest crude oil producer in the world.

Alberta is the largest provincial crude oil producer, due to oil sands production. In 2010, the share of total crude oil production by each province changed very little compared to 2009 (Figure 4).

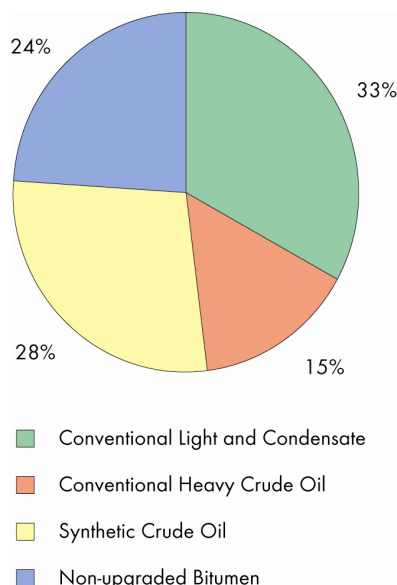
Non-upgraded bitumen and synthetic crude oil from the oil sands now make up about 52 per cent of Canadian production, an increase of two per cent from last year (Figure 5). See Appendix 1 for Estimates of Established Reserves of Crude Oil and Bitumen at 31 December 2010.

Figure 4
Crude Oil and Equivalent Production by Province, 2010



Source: Governments of energy producing provinces and NEB

Figure 5
Crude Oil and Equivalent Production by Type, 2010

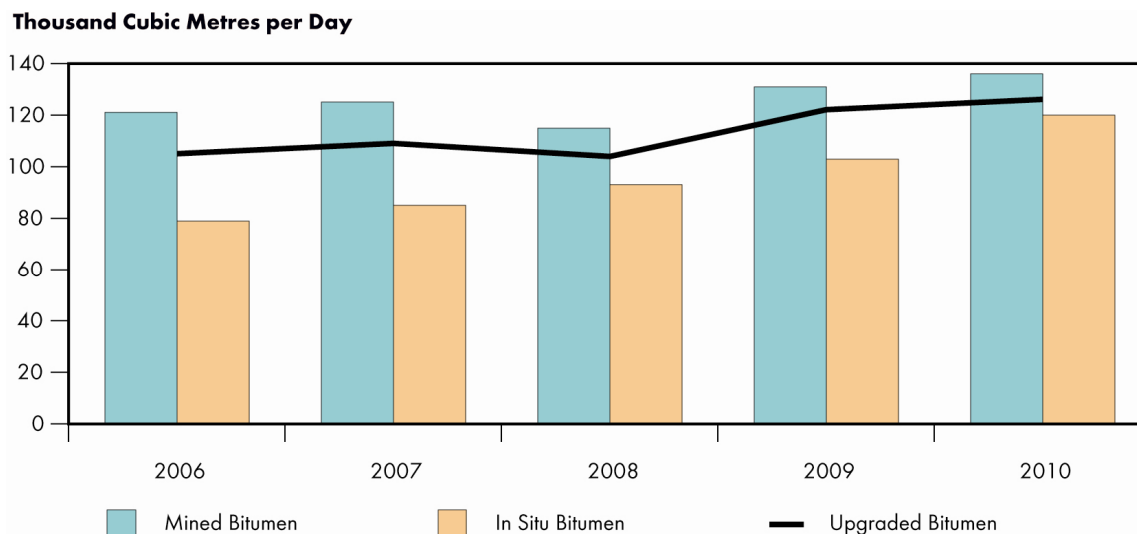


Source: Governments of energy producing provinces and NEB

Oil Sands

In 2010, oil sands capital expenditures were estimated to be \$12 billion. Crude bitumen production (before processing) from mining and in situ operations totalled 255 800 m³/d (1.61 MMb/d), an increase of 9.3 per cent compared with 2009. In situ bitumen production increased by 16.9 per cent to 120 200 m³/d (756 Mb/d) while bitumen from mining operations increased by 3.4 per cent to 135 600 m³/d (853 Mb/d) (Figure 6). Essentially all of the mined production went to upgrading, and 11 per cent of the in situ production was upgraded in 2010. A total of 125 800 m³/d (792 Mb/d) of synthetic crude oil was produced, a 3.5 per cent increase over 2009.

Figure 6
Crude Bitumen Production, 2006-2010

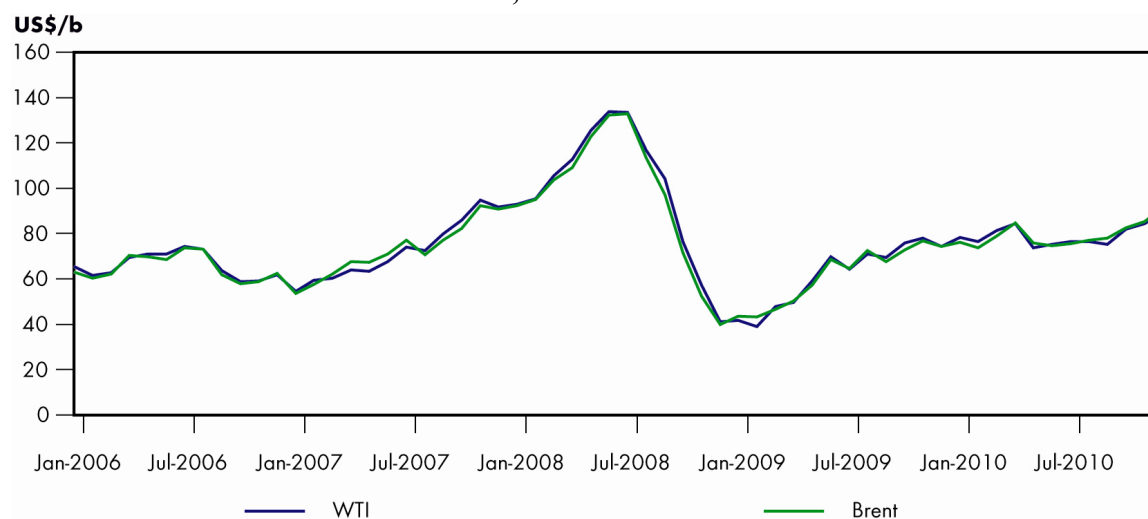


Source: Energy Resources Conservation Board (ERCB)

Crude Oil Prices

WTI oil prices averaged approximately US\$79/bbl in 2010, a 28 per cent increase from 2009 (Figure 7). In Canada, light crude prices averaged \$79/bbl and heavy crude averaged \$68/bbl. The light/heavy differential narrowed considerably following the collapse of crude oil prices in late 2008. Globally, supply and demand balances for heavy crude changed, with OPEC cutting production of heavy crude, and refineries in China, the Middle East and the U.S. adding heavy crude conversion capacity. The Canadian light/heavy differential widened over the July to December 2010 period due to a number of factors including the rupture of a major oil pipeline in Michigan (Figure 8).

Figure 7
WTI and North Sea Brent Oil Prices, 2006-2010



Source: Energy Information Administration

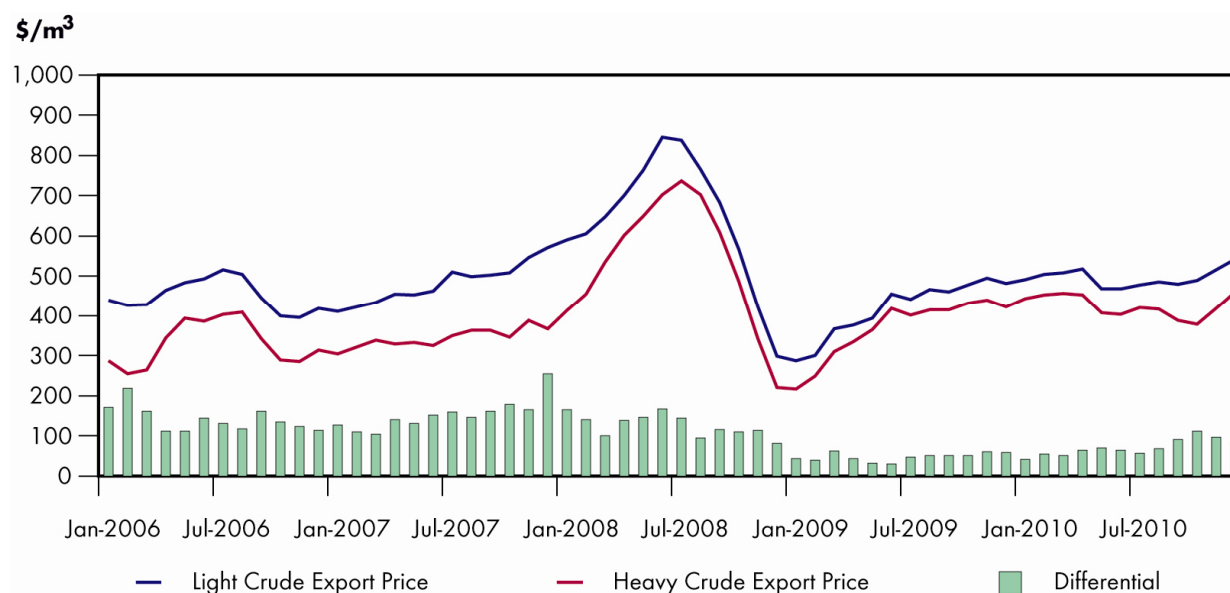
Crude Oil Exports and Imports

In 2010, crude oil exports averaged 309 224 m³/d (1.95 MMb/d), an increase of 6.1 per cent compared to 2009. The average light and heavy crude oil export prices were about \$12/bbl and \$9/bbl greater, respectively, in 2010 than in 2009 (Figure 8). The estimated value of crude oil exports for 2010 was \$51.9 billion compared with \$42.8 billion in 2009.

In 2010, crude oil imports were estimated to be 123 500 m³/d (776 Mb/d). Imports of heavy crude oil increased slightly from 2009 to 2010; however, overall crude imports declined by 3.7 per cent from 2009 because of the reduction in light crude imports. Most Canadian crude oil imports come from OPEC, the North Sea and North America.

The number of refineries in Canada decreased in the past decade. At the end of 2010, a Shell refinery closed in Montreal. In 2010, refinery utilization rates averaged about 80 per cent compared to 77 per cent in 2009. Canadian consumption of refined petroleum products in 2010 was estimated at 284 200 m³/d (1.79 MMb/d), a 7.5 per cent increase from 2009.

Figure 8
Light and Heavy Crude Oil Export Prices, 2006-2010



Source: NEB

Main Petroleum Product⁸ Exports, Imports and Prices

Canada is a net exporter of main petroleum products. Exports of main petroleum products in 2010 were estimated to be 59 900 m³/d (364 Mb/d), a 10.9 per cent increase from 2009. The primary destination was the U.S. east coast market (PADD I) with overseas exports being the second largest market.

The estimated revenue in 2010 from exports of main petroleum products was \$12.2 billion, up from about \$7.5 billion in 2009, an increase of about 38 per cent.

Canadian retail gasoline prices vary among the provinces and in 2010 averaged \$1.04 per litre, an increase of nine cents per litre from 2009 (Table 4).

Table 4
World Oil and Canadian Product Prices

Product	2009	2010	Change	Change (%)
Gasoline (cents/litre)	94.6	103.6	+9	9.5%
Diesel (cents/litre)	89.6	100.8	+11.2	12.5%
Furnace oil (cents/litre)	76.2	88.8	+12.6	16.5%
WTI (US\$/bbl, Cushing, OK)	61.95	79.48	+17.53	28%
Edmonton Par (Cdn\$/bbl)	65.36	79.00	+13.64	21%

Sources: Natural Resources Canada, Energy Information Administration, NEB

Natural Gas

The integrated Canadian and U.S. natural gas markets have various transportation connections, linking the numerous supply regions. Events that occur in any one region can affect prices in other regions, such as demand changes from weather or other factors, new pipeline infrastructure and supply additions or interruptions.

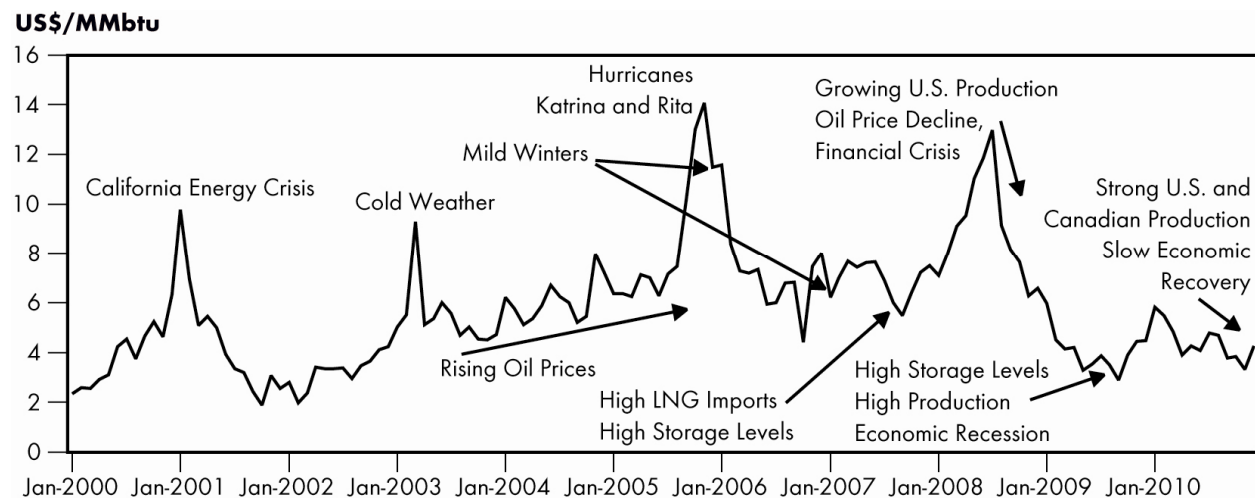
In 2010, natural gas production in Canada was estimated to have decreased by about 3.4 per cent to 412 900 m³/d (14.6 Bcf/d). In the U.S., production grew by five per cent to 1.67 million m³/d (59.1 Bcf/d), close to the 1973 record of 1.69 million m³/d (59.5 Bcf/d).⁹ Onshore production gains in the Lower 48 states, driven by shale gas development, more than offset declines in the Gulf of Mexico, where production continued its long-term decline.

In 2010, the average annual spot price at Henry Hub¹⁰ increased by 12 per cent to \$4.37/MMbtu, but remained significantly lower than average annual prices between 2003 and 2008 (Figure 9).

⁹ Energy Information Administration. *Dry Natural Gas Statistics*, (2011). Available at: www.eia.doe.gov/dnav/ng/ng_prod_sum_dcu_NUS_a.htm

¹⁰ The biggest hub where the benchmark price is established for natural gas in North America. It is the pricing point for natural gas futures contracts traded on the New York Mercantile Exchange. It is located in the state of Louisiana at the interconnection of numerous intra and interstate natural gas pipelines.

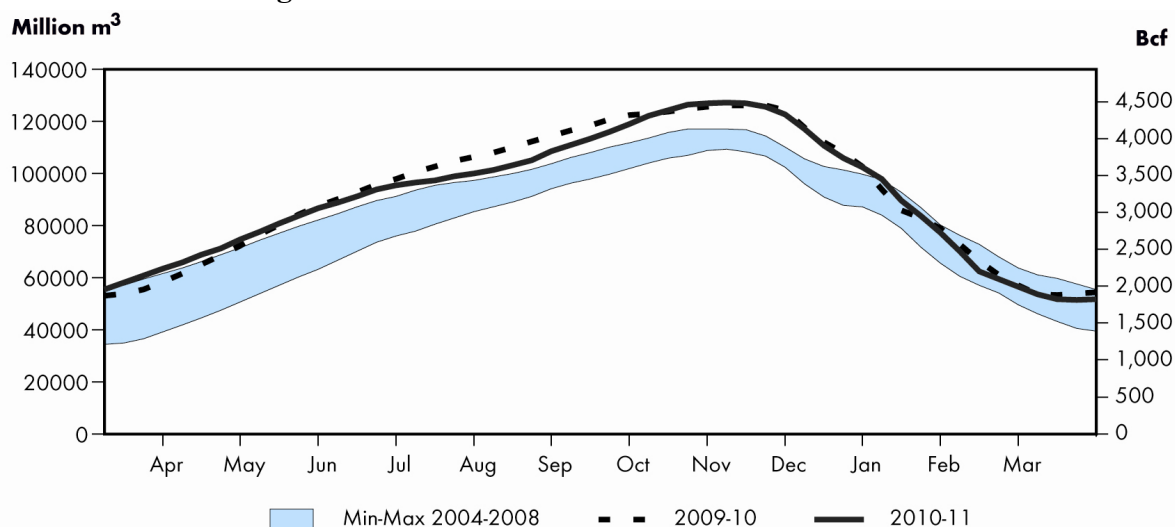
Figure 9
North American Gas Prices– Henry Hub (3-day average price)



Source: GLJ Publications Inc.

Natural gas in storage was above the five-year average and slightly below the record inventory of 2009 at the end of 2010 (Figure 10).

Figure 10
North American Storage Levels



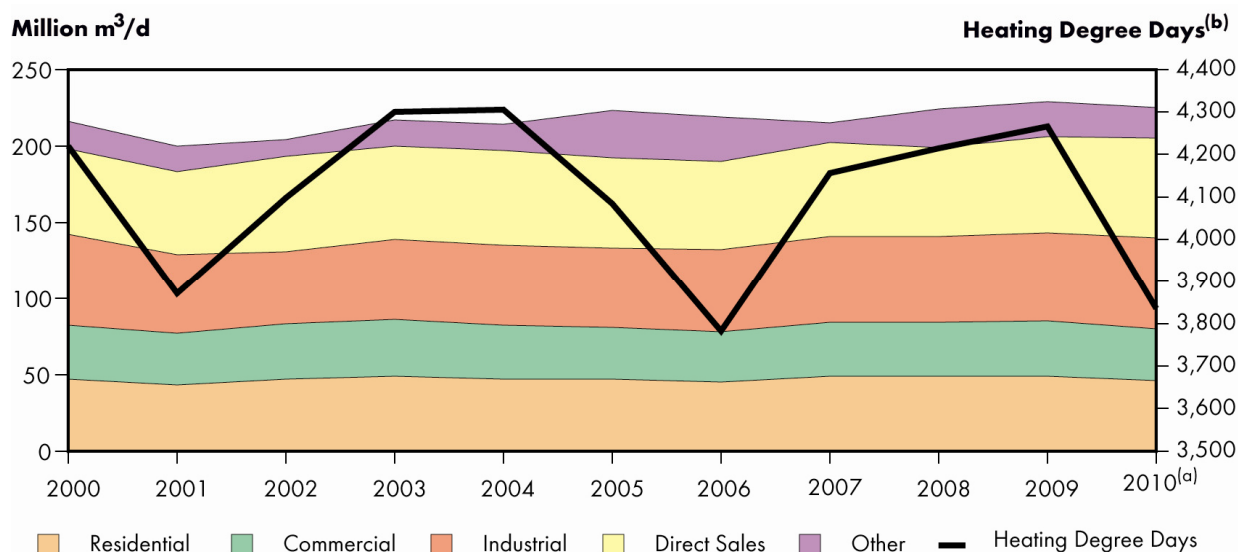
Sources: Canadian Enerdata Ltd., NEB estimates, Energy Information Administration

Natural Gas Demand

Natural gas represents about one-quarter of all energy consumed in Canada. In 2010, gas consumption was estimated at 225 million m³/d (7.94 Bcf/d), two per cent lower than in 2009 (Figure 11). Economic growth led to increased industrial gas consumption, especially in the chemical and steel sectors. Gas demand for power generation also increased in 2010. However, the residential and commercial sectors had lower consumption than in 2009 because of warmer winter weather and, therefore, fewer heating degree days.

In oil sands operations in Alberta, natural gas is used to generate electricity and steam. Steam is used for in situ oil production and in the production of hydrogen to upgrade bitumen into synthetic crude oil blends. Gas consumption by the oil sands in 2010 was estimated to be 36.6 million m³/d (1.3 Bcf/d), 8.7 per cent higher than in 2009 (Figure 12).

Figure 11
Canadian Natural Gas Consumption and Heating Degree Days

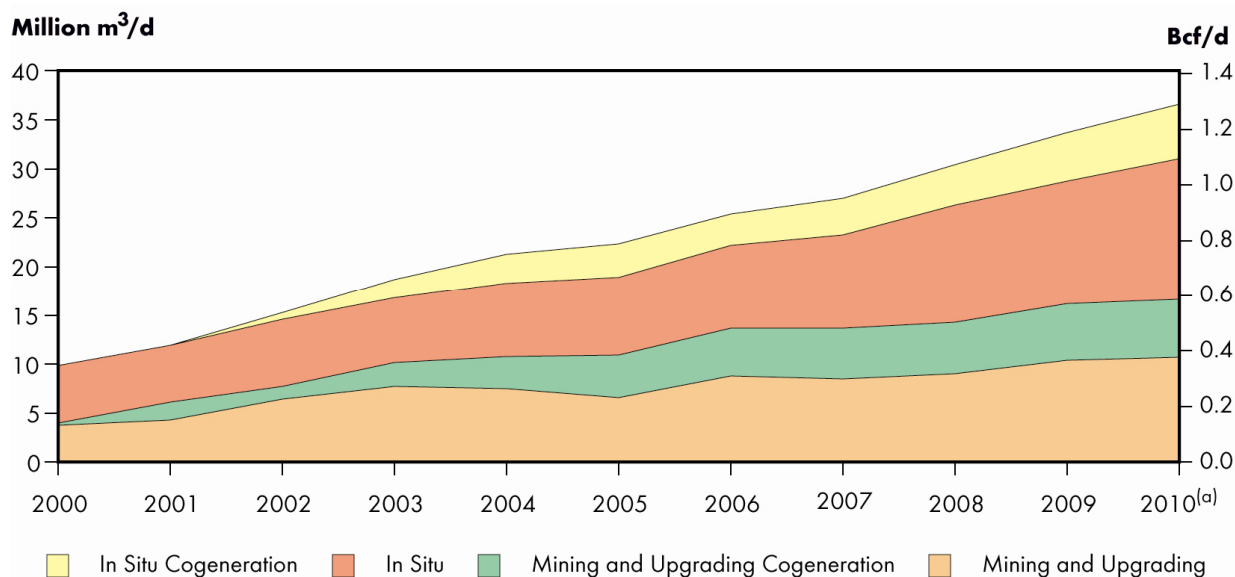


(a) Estimates

(b) Heating degree days (HDD) is an index calculated to reflect the demand for energy needed for heating homes, businesses, etc. HDD is the cumulative number of degrees in a year for which the mean temperature falls below 18.3 degrees C.

Sources: Statistics Canada, NEB estimates, and Canadian Gas Association

Figure 12
Average Annual Natural Gas Requirements for Oil Sands Operations



(a) Estimates

Sources: NEB and ERCB

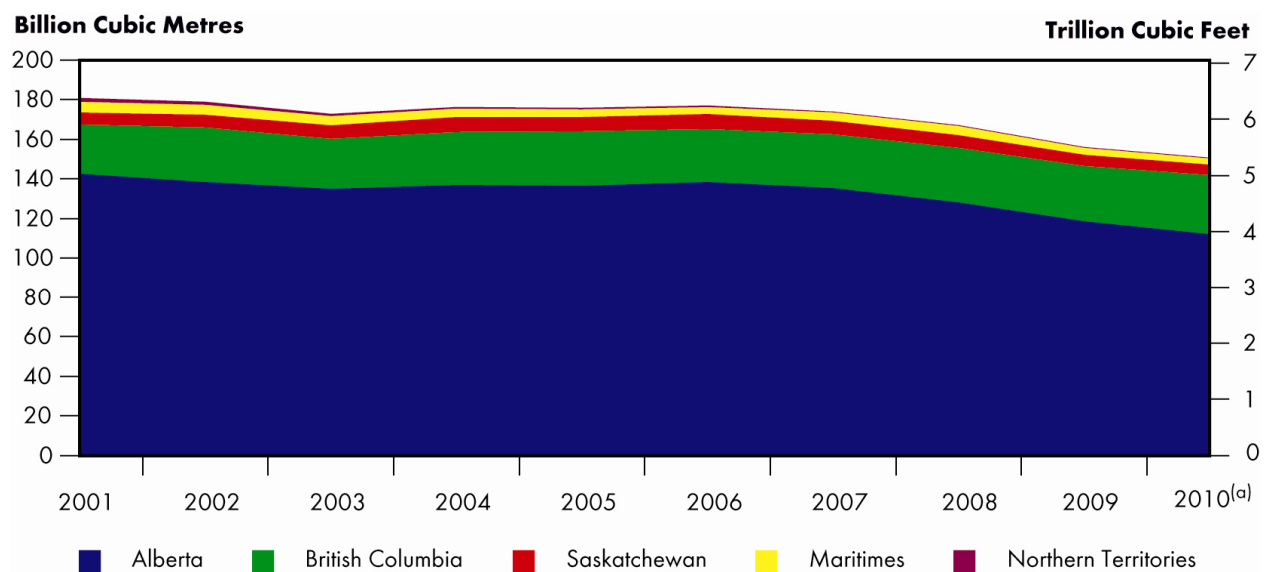
Natural Gas Supply

The biggest supply story in North America continues to be the development of tight and shale gas resources. In Canada, tight and shale gas production accounted for 36 per cent (34 per cent from tight, two per cent from shale) of total domestic gas production in 2010, up from 18 per cent in 2000. Not only have costs come down for these plays because of continued technological advances, but some of the resources, like Montney tight gas from northeastern B.C., have high NGL contents. High NGL contents improve production economics because NGL prices are linked to oil prices, which are much higher than gas prices on an energy equivalent basis.

Natural Gas Production

Total natural gas production in Canada in 2010 declined from 2009 levels (Figure 13). Growing tight and shale gas production from the Montney and Horn River Basins, respectively, were not enough to offset the declining production of conventional gas. See Appendix 2 for Canadian Natural Gas Reserves at 31 December 2010.

Figure 13
Canadian Marketable Gas Production, 2001-2010



(a) Estimates

Sources: Governments of energy producing provinces and territories

Liquefied natural gas (LNG) imports to the Canaport LNG facility in New Brunswick averaged 5.78 million m³/d (204 MMcf/d) in 2010, up slightly from the 2009 average of 5.37 million m³/d (190 MMcf/d). In 2010, Canada imported about twice as much LNG as in 2009, because Canaport began operations in the middle of 2009. In 2010, 20 per cent of LNG was imported from Qatar, 76 per cent from Trinidad & Tobago and four per cent from Peru.

Natural Gas Prices

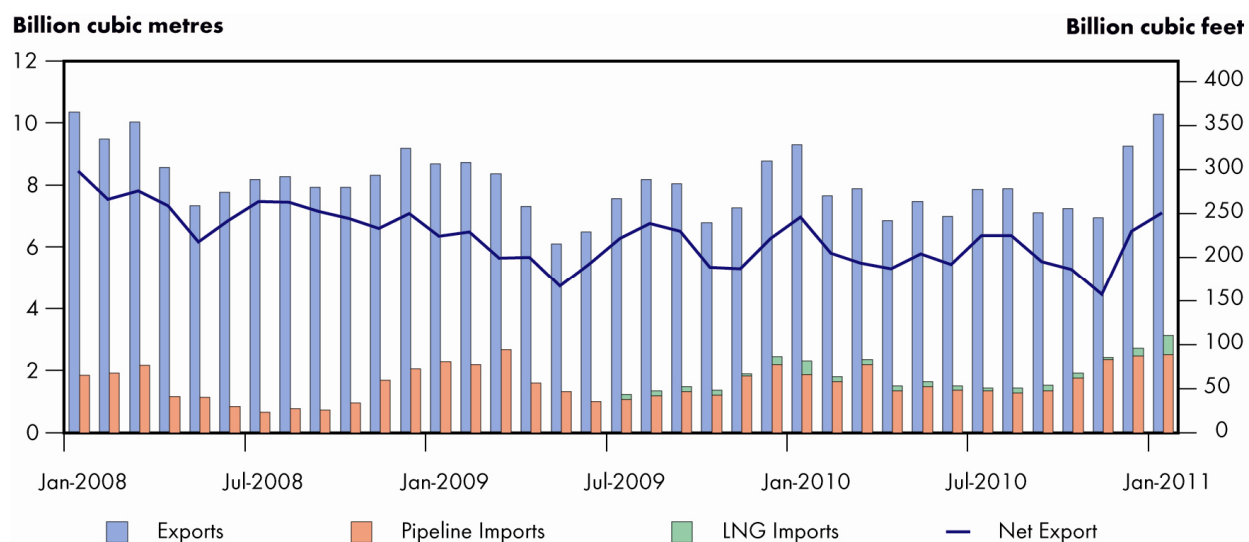
Throughout 2010, wholesale monthly Canadian natural gas prices (intra-Alberta) fluctuated between \$3.13/GJ and \$5.30/GJ. The North American market price at Henry Hub in the U.S.

ranged from US\$3.43/MMBtu to US\$5.83/MMBtu. Although higher than in 2009, prices in 2010 were below the yearly average of 2003-2008 and low relative to crude oil prices.

Natural Gas Exports and Imports

In 2010, natural gas exports were 253 million m³/d (8.94 Bcf/d), about 0.2 per cent higher than in 2009. Net natural gas exports for 2010 were 69.9 billion m³ (2.47 Tcf) which was about two per cent lower than in 2009 (Figure 14). In 2010, export revenues were \$11.2 billion, a decrease of about 4.8 per cent from 2009.

Figure 14
Monthly Canadian Natural Gas Exports and Imports



Source: NEB

Electricity

Based on estimates from the International Energy Agency, total OECD electricity generation reached 10 182 TW.h in 2010, an increase of 3.4 per cent over 2009. Generation by major fuel categories increased in all OECD regions except North America, where hydroelectric generation decreased by 2.7 per cent.

The Canadian power sector registered mixed signs of recovery in 2010 with higher electricity sales in major provincial electricity markets, rising wholesale electricity prices and record wind-based capacity additions. However, on the supply side, hydroelectric generation was constrained by substantially lower than historical average precipitation.

Electricity Demand

Preliminary estimates by Statistics Canada indicate that total electricity demand in Canada recovered in 2010 compared to 2009 (Table 5). Based on data from industry sources, Quebec and Ontario have registered estimated increases in domestic electricity sales of 1.1 and 2.2 per cent respectively, while Alberta and British Columbia have had 2.6 and 0.8 per cent growth.

The 2.6 per cent increase in Alberta in 2010 was the highest annual growth for the province since 2006. Robust industrial demand was a major contributor to this growth.

Table 5
Electricity Supply and Disposition (TW.h)

	2006	2007	2008	2009	2010	%Change 2009-2010
SUPPLY						
Generation	592.0	606.5	603.7	580.5	570.9	-1.6
Imports	22.1	18.4	23.8	18.6	20.2	+8.6
Total	614.1	625.0	627.5	599.1	591.1	-1.3
DISPOSITION						
Demand	574.3	575.6	571.0	545.8	545.5	-0.05
Exports	39.7	49.3	56.5	53.3	45.6	-14.4
Total	614.1	625.0	627.5	599.1	591.1	-1.3

Sources: Statistics Canada, NEB

Electricity Generation

In 2010, total Canadian electricity generation declined by 1.6 per cent from 2009 (Table 6). The decline reflected the impact of unusually low precipitation on hydroelectricity generation. As a result, the share of hydroelectricity in total generation declined to 61 per cent in 2010 from 62.5 per cent in 2009. Canada is the world's third largest hydroelectricity producer after China and Brazil.

Following a ten per cent decline in 2009, thermal generation increased by 3.9 per cent, with its share increasing to 23 per cent in 2010. With the nuclear units at the Point Lepreau and Bruce stations under refurbishment, total nuclear generation in Canada decreased slightly from the 2009 level. Wind-based electricity generation has grown significantly in recent years driven by government support and incentives.

Table 6
Electricity Production (TW.h)

	2006	2007	2008	2009	2010	% Change 2009-2010
Hydroelectric	349.5	365.8	373.0	363.1	348.1	-4.1
Nuclear	92.4	88.2	88.6	85.3	85.2	-0.1
Thermal	147.6	149.6	138.3	125.5	130.4	+3.9
Wind and Tidal	2.5	2.9	3.8	6.6	7.2	+9.0
Total	592.0	606.5	603.7	580.5	570.9	-1.6

Sources: Statistics Canada, NEB, CanWEA

Electricity Plant Capacity Development

In 2010, Canada's installed generating capacity was close to 134 000 MW by year-end. There was noticeable growth in wind-based and gas-fired capacity additions, as well as retirement of coal-fired capacity. In 2010, Alberta added 270 MW of new generation capacity to its power grid, of which 214 MW were wind-based. The last unit (279 MW capacity) at the Wabamun coal-fired power station was retired in March 2010. Sask Power reported 138 MW capacity additions to its generation base. Pursuing its plan to phase out coal-fired generation by 2014, Ontario closed 1 730 MW of coal-fired capacity in October 2010. This capacity decline was partially offset by the addition of two gas-fired facilities contracted by the Ontario Power Authority: the 236-MW Thorold cogeneration plant and 642-MW Halton Hills combined-cycle power plant. Furthermore, construction activities on the Lower Mattagami River commenced in June 2010 to add one additional generating unit at each of the existing Little Long, Harmon and Kipling stations. When completed in 2015, this project will add 438 MW to Ontario's provincial grid. In Quebec, Hydro-Québec decommissioned a unit at the Tracy generating station, resulting in a slight decline in its total installed capacity to 36 671 MW by year-end 2010.

Total installed wind-based capacity in Canada increased by 690 MW or 21 per cent in 2010, reaching 4 008 MW by year-end 2010. Ontario, Quebec and Alberta are leading in terms of installed wind-based capacity.

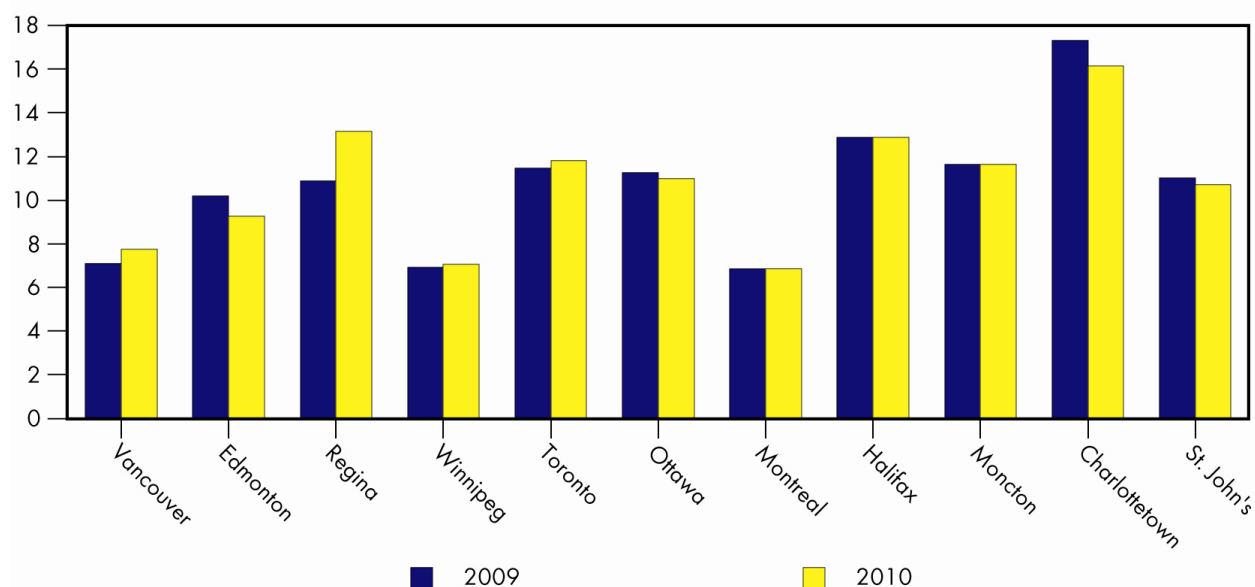
Electricity Prices

Canadian consumers continued to benefit from relatively stable end-use electricity prices in 2010 (Figure 15). Canadian electricity prices are among the lowest in the OECD countries. Prices declined in some markets, such as Edmonton and Charlottetown. Consumers in the hydro-rich provinces are less subject to changes due to volatile fuel prices. In most cases, end-use prices are regulated and reflect the combined cost of generation, transmission and distribution.

Monthly average power prices for the two Canadian wholesale power pools (in Alberta and Ontario) are generally correlated to prices in the respective adjacent American power pools. However, local supply and demand conditions and transmission constraints may occasionally cause prices to diverge.

Figure 15:
Canadian Residential Electricity Prices

Cents (Cdn) per kW.h

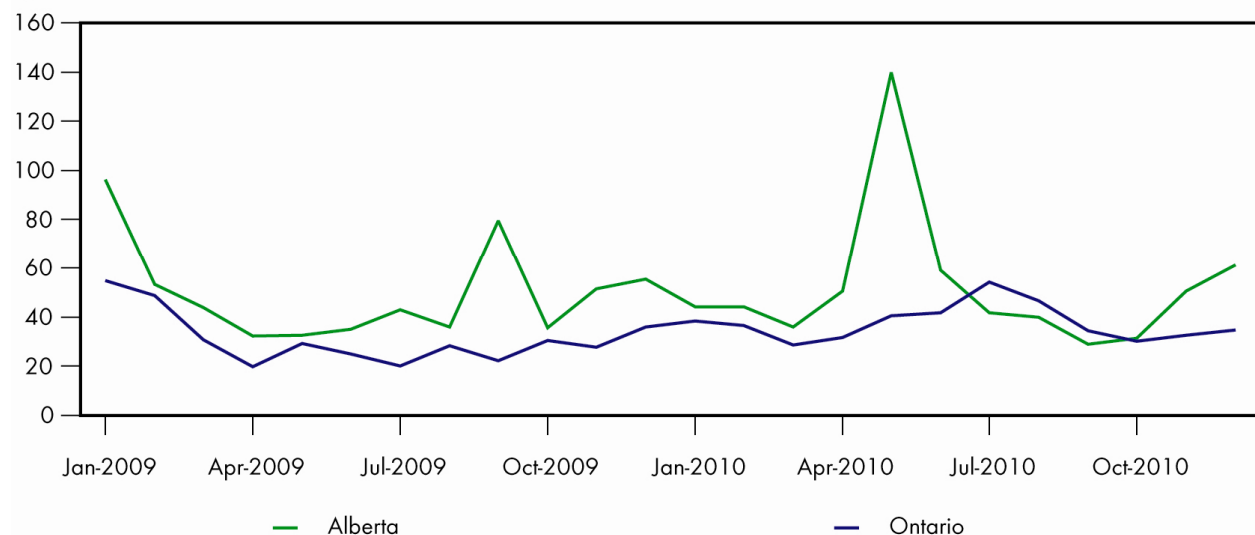


Source: Hydro-Québec, based on 1 April rates in 2009 and 2010 and a monthly consumption of 1 000 kW.h

Wholesale electricity prices in Canada remained low in 2010. Alberta's average pool price for wholesale electricity was \$51/MW.h in 2010, an increase of six per cent over 2009 (Figure 16). The price surge in May reflected transmission constraints and coal-fired unit outages which reduced supply. Wholesale prices in Ontario were generally lower than in Alberta. They increased from \$30/MW.h in 2009 to \$36/MW.h in 2010.

Figure 16
Weighted Average Wholesale Electricity Prices 2009 and 2010

\$/MW.h

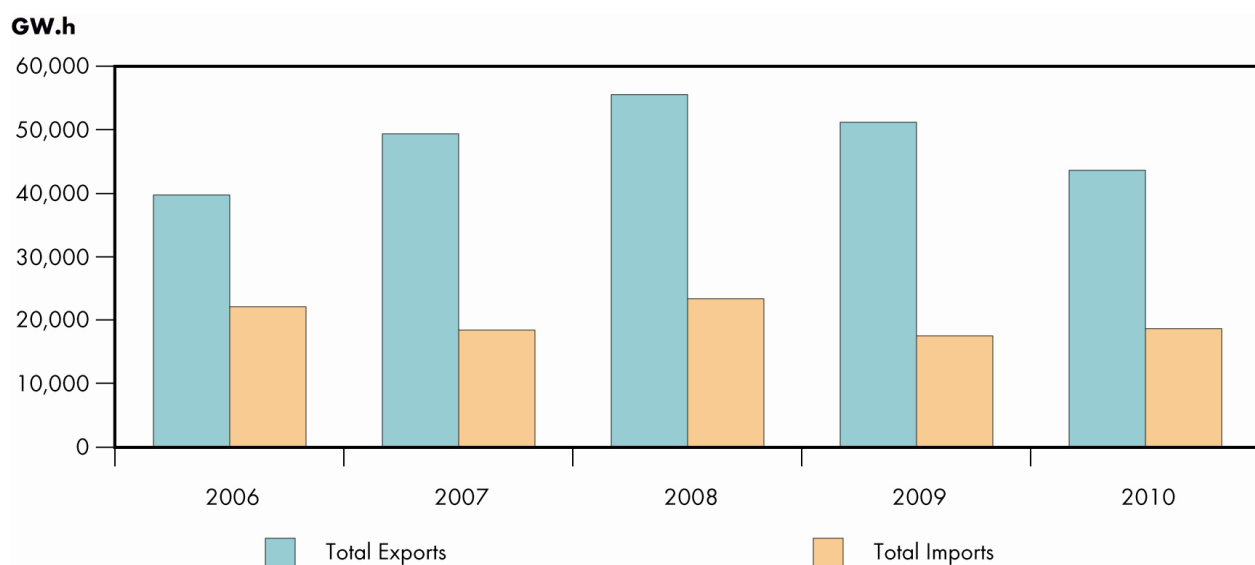


Sources: Alberta Electric System Operator, Independent Electric System Operator of Ontario

Electricity Exports and Imports

Electricity exports have historically been lower than ten per cent of Canadian generation and originate for the most part from the relatively lower cost, hydro-based, provinces (Figure 17). Exports declined by about 14 per cent from 2009, reflecting a lower surplus available for exports. In spite of marginally higher export prices averaging \$42/MW.h in 2010, lower electricity exports in 2010 resulted in export revenue at \$2.0 billion in 2010 compared to \$2.4 billion in 2009. Electricity imports were about the same as in 2009 in volume, although at lower average import prices: \$32.12/MW.h in 2010 compared to \$35.18 MW.h in 2009. Lower exports resulted in a decline in the electricity trade surplus valued at about \$1.4 billion in 2010.

Figure 17
Annual Electricity Exports and Imports



Source: NEB

Electricity Capacity Reserve Margin

By year-end 2010, Canadian electricity markets, which are mostly winter peaking, were estimated to have adequate reserve margins. The North American Electric Reliability Corporation's (NERC) anticipated capacity reserve margins for the Canadian electricity markets are higher than NERC reference reserve margins. In Alberta and British Columbia combined, the reserve margin is closer to the NERC reference margin than in other Canadian electricity markets (Table 7).

Table 7**Estimated 2010 Winter Demand, Resources and Reserve margins in Canada**

		Total internal demand (MW)	Capacity resources (MW)	Reserve margin (%)	NERC Reference Reserve margin (%)
<u>Canada</u>					
MRO	(SK&MB)	7 560	9 074	25.0	10.0
NPCC		65 073	78 888	25.3	15.0
	Maritimes	5 655	7 243	37.4	15.0
	Ontario	22 473	31 112	38.4	18.9
	Quebec	36 945	40 533	15.2	10.0
WECC	(AB&BC)	21 243	24 463	15.2	13.2
Total-Canada		93 876	112 425	23.0	15.0

MRO: Midwest Reliability Organization. The MRO includes the provinces of Saskatchewan and Manitoba.

NPCC: Northwest Power Coordinating Council. The NPCC includes the provinces of Ontario, Quebec, and the Maritimes.

WECC: Western Electricity Coordinating Council. The WECC includes the provinces of Alberta and British Columbia.

Source: NERC 2010 Long-Term Reliability Assessment, NEB

Appendix 1

Estimates of Established Reserves of Crude Oil and Bitumen at 31 December 2010 (million cubic metres)

Conventional Crude Oil	Initial	Remaining
British Columbia ^(a)	131.2	19.3
Alberta ^(b)	2 829.7	236.9
Saskatchewan ^(c)	935.7	140.9
Manitoba ^(d)	52.6	9.5
Ontario ^(e)	15.0	1.6
Northwest Territories, Nunavut and Yukon ^(f)		
Arctic Islands and Eastern Arctic	0.5	0
Mainland Territories - Norman Wells and Cameron Hills	52.9	11.8
Nova Scotia - Cohasset and Panuke ^(g)	7.0	0
Newfoundland - Hibernia, Terra Nova and White Rose ^(g)	344.3	154.9
Total	4 368.9	574.9
Total (millions of Barrels)	27 480.4	3616.1
Crude Bitumen		
Oil Sands - Mineable	6157.0	5 389.0
Oil Sands - Bitumen	21 935.0	21 509.0
Total	28 092.0	26 898.0
Total (millions of barrels)	176 698.7	169 188.4
Total Conventional and Bitumen	32 460.9	27 472.9
Total Conventional and Bitumen (millions of barrels)	204 179.1	172 804.5

(a) British Columbia Hydrocarbon and ByProducts Reserves 2009

(b) Alberta ERCB Reserves Report and Supply & Demand Report 2010

(c) Saskatchewan Reservoir Annual 2007

(d) Manitoba's Designated Oil Pools

(e) Canadian Association of Petroleum Producers

(f) NEB for estimates of reserves in the Mainland Territories and Arctic Islands

(g) Offshore Petroleum Board estimates of reserves of the east coast offshore

Appendix 2

Canadian Natural Gas Reserves* at 31 December 2010 (billion cubic metres)

	Natural Gas Reserves		
	Initial Reserves	Cumulative Production	Remaining Established Reserves
British Columbia	1 142.4	601.9	540.5
Alberta	5 130.7	4 075.0	1 055.7
Saskatchewan	260.4	196.7	63.7
Subtotal - WCSB	6 533.5	4 873.6	1 659.9
Ontario	54.3	34.9	19.4
New Brunswick	4.1	0.2	3.9
Nova Scotia Offshore	55.0	47.2	7.8
Mainland NWT & Yukon	32.4	19.1	13.3
Mackenzie Delta	0.3	0.1	0.2
Subtotal - Frontier	91.8	66.4	21.3
Total Canada (billion m³)	6 679.6	4 974.9	1 700.6
Total Canada (trillion cubic feet)	237.1	176.6	60.4

Source: NEB

* Natural gas reserves are defined as the total amount of marketable gas in discovered pools that can be extracted in current economic conditions.