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# CANADIAN NATURAL GAS MARKET REVIEW





## **CANADIAN NATURAL GAS MARKET REVIEW**

## Canadian Natural Gas Market Review

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# Executive Summary

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This study looks at the future of Canada's natural gas upstream industry, taking into consideration the history of the industry, changing market dynamics due to the advancements in horizontal drilling and hydraulic fracturing technology, the recent drop in oil and natural gas prices, and policy developments.

Canada was estimated to have 1,087 trillion cubic feet (Tcf) of marketable natural gas resources remaining as of the end of 2014.<sup>1</sup> Just under 80 percent of this is concentrated in the Western Canadian Sedimentary Basin (WCSB).<sup>2</sup> In 2014, Canada was the fifth largest producer of natural gas globally with a volume of 5,719 billion cubic feet (Bcf) over the year, with Alberta representing approximately three-quarters of the country's production.<sup>3</sup> This level of production in 2014 meant an average rate of 10.2 billion cubic feet per day (Bcfpd), down from a peak of 14.1 Bcfpd in 2006.<sup>4</sup>

Even with these high levels of production, transportation infrastructure and economics dictate that Canada also imports natural gas from the United States, particularly in eastern Canada. Canada's demand for natural gas has risen from 7.2 Bcfpd in 2003 to 8.9 Bcfpd in 2013. While historically Canada's exports to the United States vastly exceeded its imports from the United States, this gap is shrinking as advances in the US Marcellus Shale bring lower priced gas onto the market. The demand for Canadian gas is shrinking as Marcellus gas displaces it in the market, primarily in eastern Canada.

US production of natural gas has increased sharply in recent years due to the rapid growth in production out of the Marcellus Shale. This sharp increase can be attributed to improvements in drilling technology, making previously unattractive areas productive and profitable. As of September 2015, the Marcellus Shale represented 37 percent of the total US shale production,<sup>5</sup> as illustrated in Figure E.1.

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<sup>1</sup> NEB, "Canada's Energy Future 2016". 2016

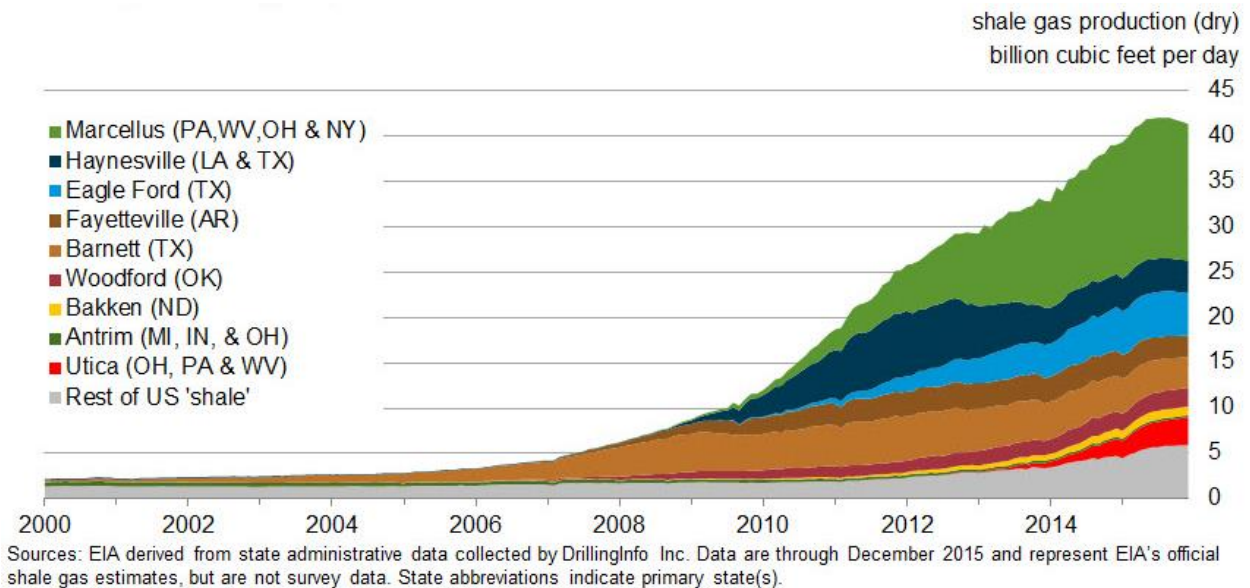
<sup>2</sup> Ibid.

<sup>3</sup> BP website, BP Statistical Review of World Energy June 2015, <https://www.bp.com/content/dam/bp/pdf/energy-economics/statistical-review-2015/bp-statistical-review-of-world-energy-2015-full-report.pdf>, pp. 22. (Accessed on February 14, 2016)

<sup>4</sup> Finance Alberta, Marketable Natural Gas Production in Alberta, <http://www.finance.alberta.ca/aboutalberta/osi/aos/data/Marketable-Natural-Gas-Production-AB.pdf> (Accessed on February 14, 2016)

<sup>5</sup> Market Realist website, Why the Marcellus Shale is important for US oil and gas, December 14, 2014, <http://marketrealist.com/2014/12/marcellus-shale-important-us-oil-gas/> (Accessed on February 14, 2016)

Figure E.1: Dry Shale Gas Production



Source: EIA<sup>6</sup>

This sharp increase in shale gas production has impacted North American natural gas markets contributing to the decline in the price of natural gas, with other influencing factors including the 2014 drop in oil prices, the financial crisis and unseasonably warm weather. Lower oil and gas prices, over-supply, and increased competition in key markets will challenge the competitiveness of Canadian natural gas exports. The unprecedented growth in natural gas production, led by the US eastern shale basins of Marcellus and Utica shales, has changed the North American gas flows and has pushed Canadian gas exports out of the markets that traditionally-sourced western Canadian gas.

Looking ahead 20 years, the price of natural gas is expected to rebound, although not reach the levels seen in 2008. This influences Canadian natural gas production, as the relatively low prices dictate that many producing regions will no longer be economically attractive. Despite this, Canadian production is expected to increase after 2019 and remain stable. With the WCSB producing 98 percent of Canada's total natural gas, the Canadian Energy Research Institute (CERI) modeled WCSB production in order to determine supply costs for various plays. British Columbia's Montney formation will continue to see high levels of interest due to its favourable supply cost, while horizontal drilling in Alberta, particularly in the corridor to the east of the Rocky Mountains will continue to see growth. There is an observable relationship between the price of natural gas and the rig count, but as drilling technologies evolve, this is likely to decouple rig count from gas price. CERI expects Canadian natural gas production to reach 21,000 million cubic feet per day (Mmcfpd) by the end of this study period.

<sup>6</sup> US Energy Information Administration website, Energy in Brief, Shale in the United States, [http://www.eia.gov/energy\\_in\\_brief/article/shale\\_in\\_the\\_united\\_states.cfm](http://www.eia.gov/energy_in_brief/article/shale_in_the_united_states.cfm) (Accessed on February 14, 2016)

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Canadian natural gas demand is expected to rise over the study period due to expected growth in population, the Canadian economy, and the shift away from coal-fired power generation. Demand is expected to reach 15 Bcfpd.<sup>7</sup> Comparing this demand with production of 21 Bcfpd means Canada could remain as a net exporter of natural gas through the next 20 years.

Should Canadian LNG projects go ahead, CERI has estimated a total of 4 Bcfpd of gas demand. This demand is matched by an increase in production out of the Horn River and Liard Basins in British Columbia. The equivalency of demand and supply in this case do not impact Canada's overall supply/demand balance.

US production of natural gas is expected to continue to increase to 138 Bcfpd<sup>8</sup> throughout the duration of this study period, with growth of 72 percent from 2016 through 2037. Specifically, shale gas production is expected to increase by 117 percent; these gains are largely seen in the Marcellus and Utica shales. US demand for natural gas is expected to grow as well, albeit not as sharply as production. Demand is expected to reach just under 100 Bcfpd in 2037, from just under 80 Bcfpd in 2016.<sup>9</sup>

As illustrated in Figure E.2, Canada has the potential to continue as a net exporter of natural gas to the US through 2037. However, the flows of natural gas are dictated by existing pipelines, and regional balances see western Canada continuing to export gas to the US and to eastern Canada, and eastern Canada also receiving imports from the US.

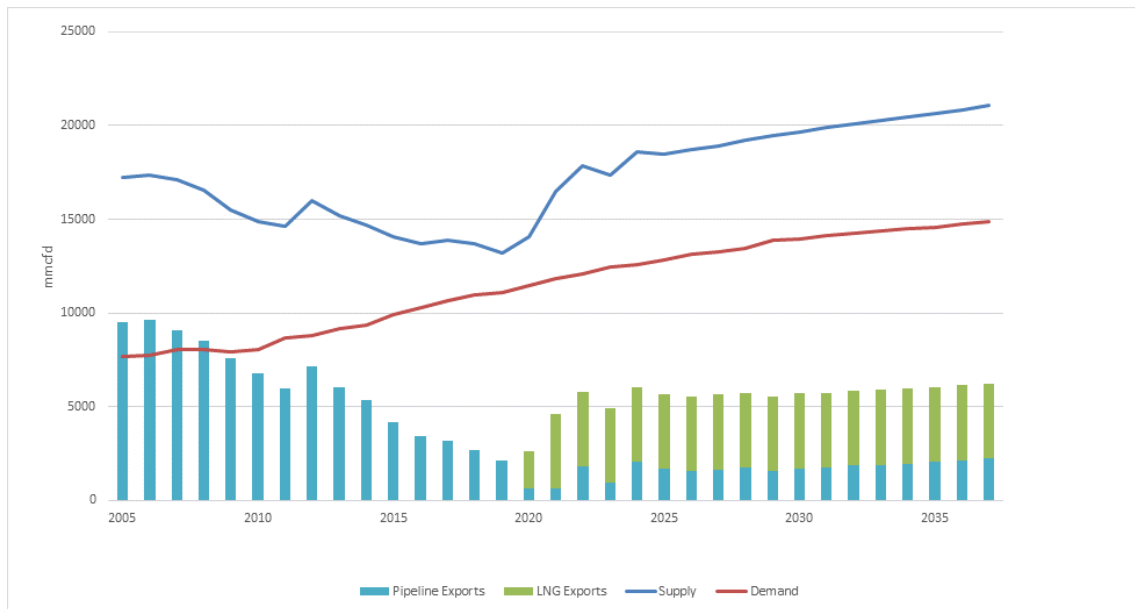
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<sup>7</sup> This value of natural gas demand is lower than the primary natural gas demand value discussed in Chapter 3 because it does not include non-marketed natural gas used directly by those that produce it. Examples of this include flared gas, natural gas produced and consumed by in situ oil sands producers, and natural gas produced and consumed by offshore oil production.

<sup>8</sup> U.S. Energy Information Administration, Annual Energy Outlook 2015, April 14, 2015, <http://www.eia.gov/forecasts/aeo/>

<sup>9</sup> Ibid.

Figure E.2: Canadian Supply and Demand Outlook



Source: CERl, NEB

With the large increase in production, specifically from the low-cost Marcellus, the market for Western Canadian gas is not growing at the rate it once was. Expected pipeline additions to the US Midwest from Marcellus will further increase the regions which the Marcellus can supply.

The export volumes projected in Figure E.2 indicate the maximum estimated amount assuming BC LNG projects proceed.