

# ECONOMIC VIEWPOINT



## A Natural Gas Market in Transition

Technological advances in shale gas extraction have enabled the United States to drastically increase its natural gas production and become a net exporter. This increased supply on the U.S. market has also driven down prices in North America, compared to Europe and Asia. The growing needs for natural gas around the world and the massive reserves in the United States should trigger a transition in the global market, as trade travels further and the market for liquefied natural gas gains traction. Greater integration in the natural gas market would create an opportunity for Canada, as the demand for natural gas from its only client, the United States, wanes.

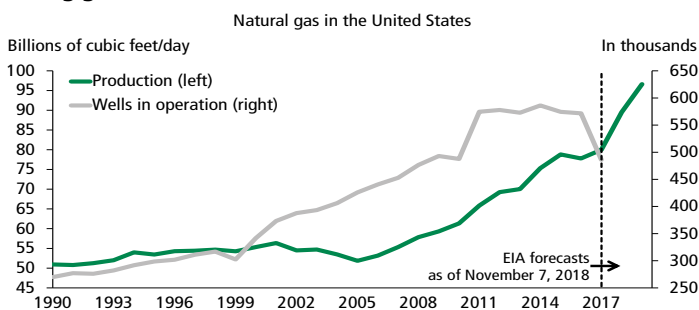
### U.S. Output Soars on Technological Advances

Innovations in hydraulic fracturing have significantly changed the natural gas market in the United States. Known as “fracking,” it’s the method used to extract natural gas and oil trapped in sedimentary rock. These advances have made it possible to increase the efficiency of wells and reduce extraction costs. Moreover, natural gas and oil are often both found in the rock, meaning that a favourable oil market inevitably leads to a bump in production for both commodities. The presence of natural gas in oil wells has also brought the breakeven cost of extracting this commodity from oil-rich areas below zero. This of course has led to a surge in natural gas production in the United States (graph 1), where more than 75% of output is extracted by non-conventional methods such as fracking. Yet the number of natural gas wells in operation has been stable since 2010, which highlights the productivity gains. The Energy Information Administration (EIA) estimates that

production should continue to rise at an accelerated pace as efforts are made to further increase output productivity in this sector.

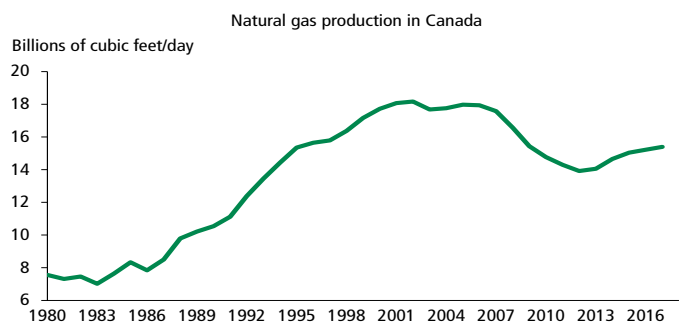
The United States has been the main beneficiary of these technological advances, however. Production in Canada has declined since 2007 (graph 2), and the ramped up production of shale gas and tight reservoirs is unable to offset the drop in output from conventional sources. In addition, the proved reserves, meaning the quantity that can be extracted profitably based on the prevailing economic and technological context, are much lower in Canada than in the United States. At the end of 2016, Canada had 73,000 bcf (billion cubic feet) in proved reserves, while the United States had 341,000 bcf. The United States has the fourth largest proved reserve in the world after Russia, Iran and Qatar. Yet it has outproduced every other country since 2011, making North America the region with the

**GRAPH 1**  
**U.S. natural gas production is expected to maintain the same strong growth seen in the last decade**



EIA: Energy Information Administration  
 Sources: EIA and Desjardins, Economic Studies

**GRAPH 2**  
**Unlike in the United States, natural gas production in Canada has slowed since 2007**



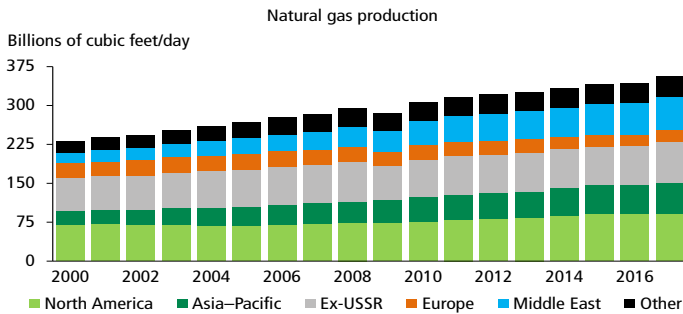
Sources: Energy Information Administration and Desjardins, Economic Studies

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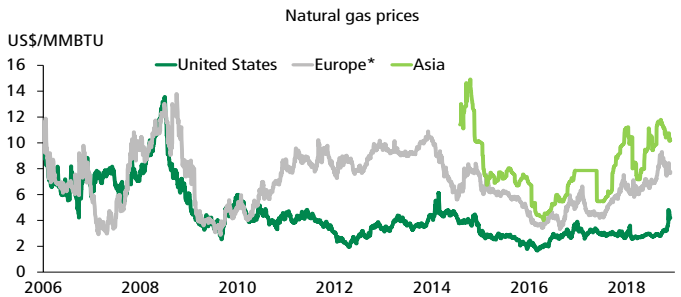
highest output (graph 3). One consequence of this has been a flood of natural gas on the North American market, which has kept prices at much lower levels than anywhere else (graph 4).

**GRAPH 3**  
North America is becoming a major natural gas producer



Sources: BP and Desjardins, Economic Studies

**GRAPH 4**  
Since 2010, U.S. natural gas prices have diverged from prices in Europe and Asia



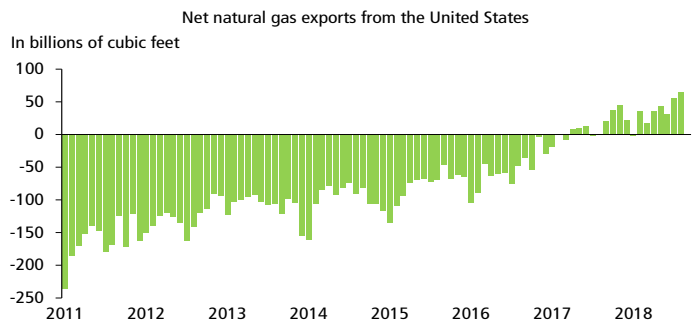
MMBTU: Million British Thermal Units; \* Average prices in the United Kingdom and the Netherlands.  
Note: Prices for Asia before August 2014 are unavailable.  
Sources: Bloomberg and Desjardins, Economic Studies

The impact was also felt in Canada, since the two countries' markets are heavily integrated and the United States makes up for the totality of Canada's natural gas exports. The network of pipelines that interconnects both markets allows for the seamless exchange of natural gas. However, since the United States started developing shale gas operations, imports of Canadian natural gas to the United States have declined while the latter's exports to Canada have increased. This drop in U.S. demand for Canada's natural gas combined with limited pipeline capacity means that Canada's output is now available at an additional discount. The downside pressures are such that Western Canadian natural gas prices tipped into negative territory a few times in 2018. This discouraged investment in operations, especially in Canada, where oil prices were also weaker than anywhere else.

**The International Dynamic Is Starting to Change**

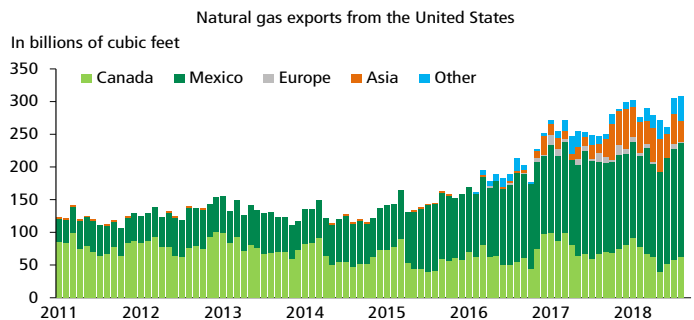
Developments in the U.S. natural gas market have also triggered changes in the global market. Unlike oil, the natural gas market is still not very integrated globally and trade tends to be regional. Transporting natural gas by means other than pipelines requires additional infrastructures as it has to be converted into liquid form, known as liquefied natural gas (LNG), and traded in specialized facilities. The cost to ship natural gas is therefore quite high, if we include the liquefaction and regasification process and the distances to be covered. The global trade for LNG is still half the size of the trade for natural gas by pipelines. Nevertheless, since 2016, U.S. exports of LNG have grown significantly, spurred by growing global demand, investments in infrastructure and cheaper U.S. prices. This has led to a turnaround in the market, with the United States now a net exporter since 2017 (graph 5). These exports are also being sent to increasingly distant and diverse destinations (graph 6). For its part, Canada is still lacking the infrastructure required to enable exports by sea, which explains Canada's heavy reliance on U.S. demand. Several projects are being assessed, including one that is equivalent to 3.5 bcf per day that recently moved to

**GRAPH 5**  
The United States recently became a net natural gas exporter



Sources: Energy Information Administration and Desjardins, Economic Studies

**GRAPH 6**  
U.S. natural gas being sent further offshore



Sources: Energy Information Administration and Desjardins, Economic Studies

the construction phase (table 1). Evaluate Energy estimates that with the current projects on the table, by 2025, Canada could have the second largest export capacity after the United States. As it stands, Australia and Qatar currently have the largest export capacity.

**TABLE 1**  
10 biggest projects to build liquefied natural gas export facilities in Canada

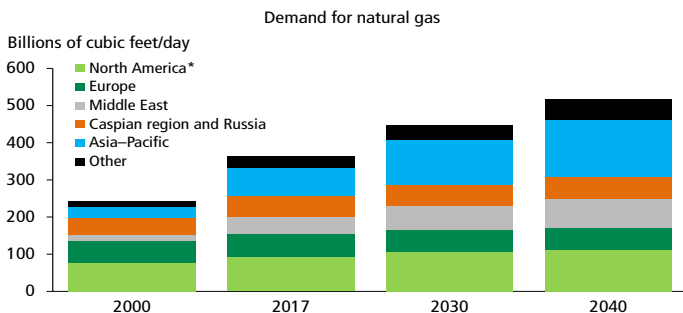
PROJECTS UNDER WAY	EXPORT CAPACITY (BILLIONS OF CUBIC FEET/DAY)	LOCATION
Steelhead LNG	4.3	British Columbia
WCC LNG	4.0	British Columbia
Stewart LNG Export Project	4.0	British Columbia
LNG Canada (under construction)	3.5	British Columbia
Orca LNG	3.2	British Columbia
Kitsault Energy Project	2.7	British Columbia
Discovery LNG	2.6	British Columbia
A C LNG	2.1	Nova Scotia
Bear Head LNG	1.6	Nova Scotia
Énergie Saguenay	1.6	Quebec

Sources: Natural Resources Canada and Desjardins, Economic Studies

**Demand Is Exploding**

The demand for natural gas is rising quickly, in line with production. Environmental concerns have prompted countries to adopt policies that promote the use of greener energy. The limited availability of renewable energies makes natural gas the most favourable replacement for coal and oil. Renewable natural gas production, which would be carbon neutral, is also viewed as a potential alternative, but it's still more expensive and more limited than gas from fossil sources. Countries are starting to partially replace coal and oil as their energy sources with natural gas, which is cleaner and more affordable. This effect can mostly be seen in the Asia-Pacific region, with China leading the demand for natural gas to meet its environment policy introduced in 2013 (graph 7). The International Energy Agency (IEA) also expects global demand

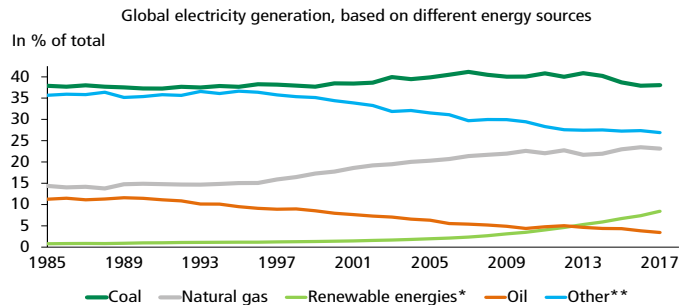
**GRAPH 7**  
Demand for natural gas in Asia-Pacific could grow the most



\* Excluding Mexico. Sources: International Energy Agency and Desjardins, Economic Studies

to keep surging. The use of coal to generate electricity remains high on a global scale however; coal accounts for more than one third of all the electricity produced (graph 8). The strong demand in emerging nations is behind this trend. The use of natural gas and renewable energies is growing, and this trend is expected to continue in the future. This would imply a significant increase in natural gas consumption, mostly in emerging nations where its use is not as widespread, thereby creating an opportunity for exporting countries.

**GRAPH 8**  
Increased use of greener energies to generate electricity hasn't curtailed the use of coal



\* Solar, geothermal and wind energy; \*\* Hydropower, nuclear and biomass energy. Sources: BP and Desjardins, Economic Studies

At the moment, Europe and Japan are the largest importers of natural gas. In Japan, imports cover almost 100% of the country's demand for natural gas. Japan's main suppliers are Australia, Qatar and Indonesia, but the country recently started importing natural gas from the United States. Growing demand in China is driving the need for more imports to that country, which could propel China to top Japan as an importer. Since most of the natural gas imported to these countries is LNG, both are competing for the same resources. And the large price gap between the Asian and U.S. markets is prompting both countries to turn to the United States.

Production in Europe, excluding Russia, is gradually decreasing as its wells reach maturity. Europe's needs for greener energy continue to grow, as several countries in that continent adopt environmental policies to eliminate the use of coal. In 2016, 70% of the European Union's (EU) demand for natural gas was met through imports, about one third of which came from Russia through pipelines. This dependency on one country, with whom relations are strained, comes with some uncertainty for Europe. As a result, the EU has tried to diversify its sources and increase its import capacities for LNG. The EU now has about one fifth of the world's import capacity, or about 20 bcf per day. The utilization rate of LNG import facilities recently declined, however, from 50% in 2010 to about 25%, as trading in LNG remains limited and expensive.

### Implications and Opportunities

Demand for natural gas should keep growing for the foreseeable future, meaning that net importers will be competing with each other increasingly for the same LNG resources. Developments in the United States and Canada should give both countries a bigger share of the global market. Canada still lacks the infrastructure to export LNG, but projects that are currently being evaluated could help it capitalize on this strong foreign demand. Canada's proximity to Asian countries could even give it a competitive edge over the United States. However, considering the size of their reserves, the low extraction costs and the investments made, the United States should continue to dominate the international market. An increase in intercontinental trade in the natural gas market would create greater integration, and in time benchmark prices would likely converge, similar to the oil market. This may not be a done deal, but recent developments suggest that the market is heading in this direction.

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