Natural Gas: Responsive Shale Production to Restrain Pricing

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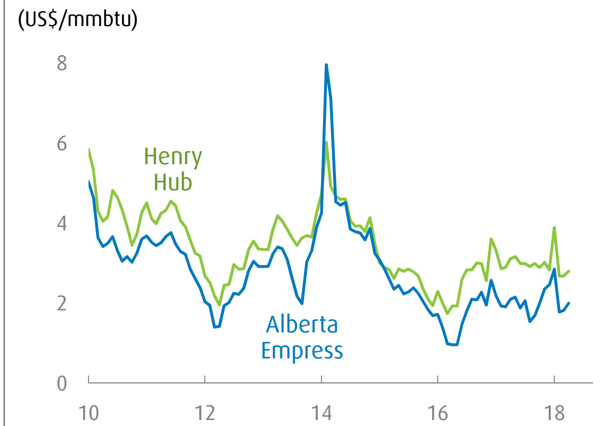
Even with crude oil hitting its highest level since 2014, natural gas has simply not joined in the rebound and remains weak by historical standards. Despite a very cold start to the winter of 2017-18 in major heating regions in North America and the resulting sharp drawdown in underground storage of natural gas, pricing is soft. On a monthly-average basis, following a brief spike to US$3.90 per million British thermal units (mmbtu) in January (and almost $7 briefly at the beginning of that month), U.S. benchmark Henry Hub weakened notably, falling below the $3 mark in early February and, since then, averaging just $2.65 (*Chart 1*). While volatile, the discount on natural gas in western Canada has been larger than its historical average, keeping prices there below the US$2/mmbtu mark in March and first half of April. The build-up of supplies in Alberta stems from pipeline bottlenecks and increasing competition in traditional eastern Canada gas markets from the prolific Marcellus field in the Appalachian Basin.

For much of 2016 and the first half of 2017, highly elevated U.S. inventories of natural gas—which surged to almost 55% above their five-year seasonal average in early 2016 (*Chart 2*)—contributed to a downdraft in pricing. In turn, weak prices led to a notable decline in drilling activity, causing U.S. production of natural gas to drop 7.5% y/y in early 2017 *(Chart 3*). This, plus continued growth in natural gas net exports, helped reduce inventories, which have now fallen to approximately 20% below their five-year average for this time of year. While that would normally put upward pressure on pricing, this has not occurred, as market participants are focusing on the rebound in domestic production from shale formations over the past six months and are anticipating a rapid inventory rebuild over the summer.

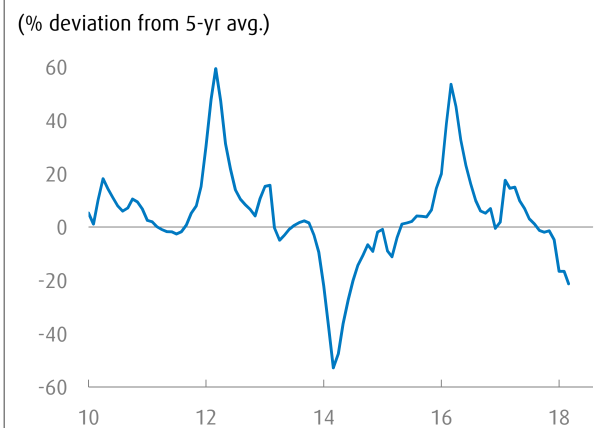
The swing in inventories from excess in early-2017 to deficit currently would have been even more pronounced had U.S. domestic consumption of natural gas continued to rise at its 10-year trend rate of 2.4%. However, demand actually slipped 1.4% last year (*Chart 4, next page*), largely due to a temporary, albeit sharp, reversal of rising utilization of natural gas by power utilities. Over the past two decades, as natural gas' share of power generation increased, largely at the expense of coal, utility consumption of the fuel rose at an average annual pace of 4%. Last year, however, utility demand for natural gas plunged 7.3% as relatively moderate summertime temperatures reduced air-conditioning-demand for power generation. With U.S. domestic production closing the gap with consumption in

Chart 1
Natural Gas Prices



Sources: BMO Economics, Haver Analytics

Chart 2
U.S. Natural Gas Inventories



Sources: BMO Economics, Haver Analytics

Chart 3
U.S. Natural Gas Production

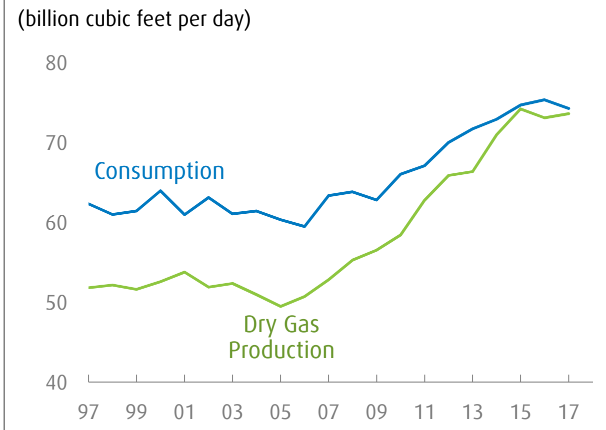
Sources: BMO Economics, Haver Analytics

2017, the United States became a small net exporter of natural gas (*Chart 5*). Although the trend towards U.S. self-sufficiency in natural gas had earlier led to a notable decline in imports from Canada—from 10.4 billion cubic feet per day (bcf/d) in 2007 to 7.2 bcf/d during 2014-2015—this trend has been subsequently reversed, with imports from Canada rising to 8.1 bcf/d in 2017. This highlights the increasing integration of the North American natural gas market and the beginning of its integration with global gas markets through liquefied natural gas (LNG) exports.

Although U.S. domestic production and consumption of natural gas are now closely aligned, rising exports to Mexico and eastern Canada and the acceleration in LNG exports (*Chart 6*) have opened up room for Canadian gas in western U.S. markets. With rising LNG export capacity and a gradual recovery in the demand and pricing for LNG in global markets, U.S. exports are likely to continue to grow briskly, further integrating the North American market with the generally higher-priced offshore market. The U.S. Energy Information Administration estimates that natural gas liquefaction capacity will increase from approximately 2.8 bcf/d at the end of 2017 to almost 4.5 bcf/d by the end of this year, followed by a more than doubling of capacity to 9.6 bcf/d by year-end 2019.

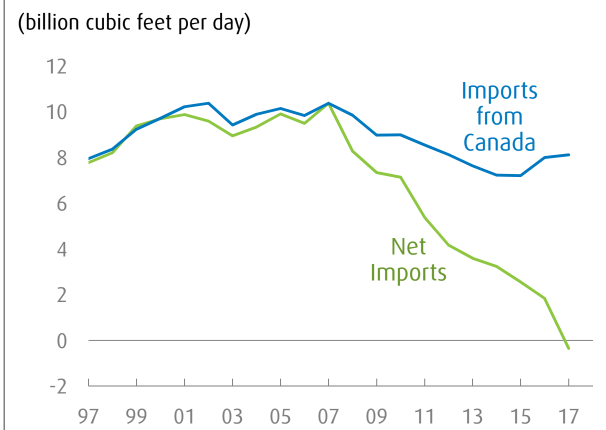
Overall, **natural gas pricing in North America is expected to improve modestly this year from its current level**, though gains are likely to be capped by robust growth in U.S. production. We expect Henry Hub to average US$3.00/mmbtu in 2018 (almost identical to 2017) and US$3.10 in 2019. **The risk to this forecast is skewed to the upside** and could stem from a number of factors. First, underground storage of natural gas has exited winter at a low level, requiring elevated injections to get it back to an adequate amount prior to the next heating season. This required inventory build could be challenged by the unusually cold April and current long-term weather projection of a warmer-than-average summer, which would generate a strong rebound in natural gas consumption by utilities. Even prior to the summer cooling season, demand by power generators started to strengthen on a seasonally-adjusted basis late in 2017. Second, and also on the demand side, utilization of natural gas by industry—second only to power generation in terms of quantity demanded on an annual basis—has accelerated in recent months and growth should speed up further in 2018 along with the overall economy and expanding petrochemical industry. In particular, the expansion of ethylene cracking capacity is leading to increased extraction of ethane that had previously been left in natural gas streams. Third, on the supply side, production growth may disappoint current expectations as intense drilling in highly prolific areas such as the Permian Basin may cause operational difficulties and a weakening in well productivity.

Chart 4
U.S. Natural Gas Market



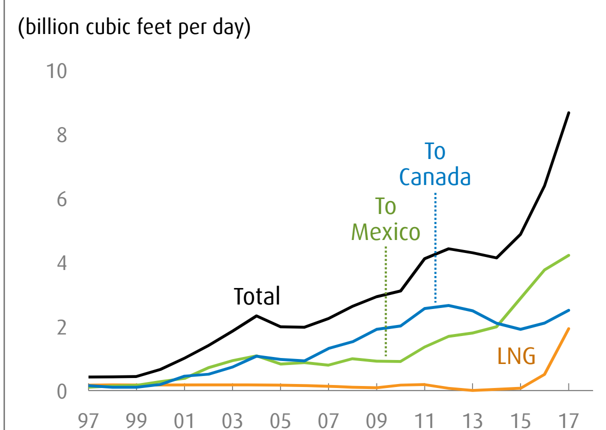
Sources: BMO Economics, Haver Analytics

Chart 5
U.S. Natural Gas Imports



Sources: BMO Economics, Haver Analytics

Chart 6
U.S. Natural Gas Exports



Sources: BMO Economics, Haver Analytics