

OIL AND NATURAL GAS

The impact of Gas Exports from North America is likely to be more Psychological than Physical over the Next Decade

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Interest in potential gas exports from North America has risen sharply over the past few years as the combination of rising US gas production, increasing gas demand in Asia and a wide divergence of gas prices across the world's major consuming regions has created an arbitrage opportunity that US and Canadian producers and Asian and European customers have been keen to exploit.

In the first ten months of 2012, according to the Energy Intelligence Group database, the price of imported LNG to Japan averaged just under \$17 per mmBtu compared to a US Henry Hub price of below \$3/mmBtu, implying a significant margin for any company that could bridge the gap, even after accounting for the cost of liquefaction and transport. Furthermore, customers in Asia have become increasingly keen to access gas from a market where prices are set by gas-on-gas competition rather than the traditional link to oil prices, in particular because the cost of new gas supplies to Asia appears to be on the rise. A number of Japanese, Chinese and Korean companies in particular have already signed contracts to purchase gas from the USA and Canada at gas market related prices, and have also begun to invest in the upstream and midstream assets that could potentially supply the gas exports.

However, despite the commercial enthusiasm to see gas exports emerge from North America, the US and Canadian authorities have to date only authorised one liquefaction project each, at Sabine Pass in Texas and at Kitimat in British Columbia. The main reason for this reticence has been uncertainty over the economic, environmental and political impact of gas exports, as the respective governments have tried to balance the clear benefit of higher export revenues against the possible negative domestic impacts that could occur from higher gas prices and increased drilling activity. In the USA the debate has been particularly acute as domestic consumers and politicians have only recently started to enjoy

the benefits of lower energy prices as the country has reduced its dependency on the imports of both gas and oil, and many are reluctant to put this domestic boon at risk by allowing potentially unlimited export sales.

As a result of this debate the US Department of Energy was instructed to produce a report on the potential economic impact of gas exports; this report, prepared by NERA Economic Consulting, was finally published in December 2012. In it NERA concluded that under any viable scenario LNG exports would bring net economic benefits to the US economy, as although domestic gas prices would be expected to rise the increase would not be significant and any losses to US consumers would be more than outweighed by the beneficial impact of increased export revenues as well as economic activity in the upstream and midstream gas sectors. However, this conclusion has not stopped a number of lobby groups, mainly representing industrial consumers concerned about the impact of higher prices on their businesses, from registering their horror at the thought that US gas prices could double or more over the next decade if unconstrained gas exports are permitted. For example, the lobby group Industrial Energy Consumers of America argued that the NERA report contained serious flaws, while the CEO of Dow Chemical, a major gas consumer warned that large-scale LNG exports would allow high Asian gas prices to 'bleed back into the US economy'.

As a result of the findings of the report the US DoE is expected to re-start the process of considering export applications that had been put on hold during 2012. At present 15 projects have applied for the vital non-FTA export licence that would allow them unfettered access to the global gas market, and if all these schemes were to be approved then over 230 bcm of new LNG export capacity could be available from the USA by 2020 (including the already approved Sabine Pass terminal). Most of the new facilities would be

constructed on the sites of the many regasification plants that were built in the early 2000s, at a time when the United States was expected to become a major gas importer. Much of this regasification plant was left redundant following the dramatic turnaround in US production caused by the surge in shale gas output, but this historical example of market forces in action in turn highlights the risks for the developers of new gas export facilities and suggests that commercial reality will ultimately restrict the amount of new US gas export infrastructure that is actually built.

In particular it seems to be clear that, irrespective of its gas exports, the gas price in the USA is likely to rise over the next few years, and as this happens so the attraction of US gas to Asian and European buyers will decrease. In a October 2012 OIES paper 'The Potential Impact of North American LNG Exports', a range of estimates for the future cost of US production was analysed to produce a consensus range for future US gas prices of US\$4–7/mmBtu, with a most likely mid-range of US\$5–6/mmBtu. As can be seen in Table 1 the likely delivered price of gas to Europe at a US gas price of US\$6/mmBtu would be US\$10.6/mmBtu, while the delivered cost to Asia would be US\$12.4/mmBtu.

While both of these prices appear very competitive compared to the average oil linked prices in both continents during 2012, comparisons with spot prices suggest that although US gas would be competitive in export markets it would not be as spectacularly cheap as current prices might suggest. For example, at the 7 January 2013 UK gas price at NBP of just over \$10/mmBtu US gas exports would only be competitive if the US gas price remained below \$5.50/mmBtu, implying that although some exports might reach Europe it is unlikely to be a flood. The January 2013 LNG spot price in Asia of \$17.25/mmBtu clearly suggests that US gas exports would be very attractive to consumers there, but it is interesting to

note that as recently as September 2012 the LNG spot price in Asia was as low as \$12.80/mmBtu, close to the level at which US gas exports would only be marginally attractive.

As a result it would seem that market forces rather than political constraints could act as a reasonable limiting factor for North American gas exports, and this has been emphasised by the publication by the EIA of its Annual Energy Outlook for 2013. The report highlights how rising US gas production and low US gas prices are causing a surge in gas demand in the country, with the latest estimate forecasting US gas consumption to reach 761 bcm by 2025, a level that is almost 40 bcm higher than that predicted only a year ago in the EIA's 2012 Outlook. This estimated surge in demand is likely to provide an additional spur to domestic gas prices in the USA, again reducing the incentive for large-scale exports. Furthermore, an additional catalyst for higher US prices could also be created by growing environmental concerns over the hydraulic fracking techniques and chemicals used in shale gas development. The US Environmental Protection Agency (EPA) has begun a study on the possible impact of fracking on freshwater aquifers which could lead to increased federal regulation of the upstream industry in the USA, providing another potential cause of extra costs and higher gas prices.

Market forces in export markets could also come into play of course, as if all 230 bcm of possible US LNG exports were to arrive in the global gas market by 2020, accounting for approximately two-thirds of current LNG trade, the downward price impact could be very dramatic. Furthermore, US LNG export schemes are

not the only new developments planned for the global LNG market over the next few years, with projects in Australia, East Africa, the East Mediterranean, Russia and Canada also scheduled, and US gas priced at \$5–6/mmBtu sits in the middle of the potential supply cost curve. As a result, it is likely that the market forces of supply and demand both within the USA and in export markets will create an equilibrium price that will limit the extent of US gas exports to well below the capacity of all 15 new projects currently being proposed. Indeed this is reflected in the recent EIA Outlook where, although the USA is seen as being a net gas exporter by 2020 the actual net export volumes even by 2027 are relatively low at around 40 bcm, and certainly well below the potential for LNG export facilities.

One of the reasons for the improving balance of gas trade in the United States is that imports of gas from Canada are set to continue to fall, being replaced by rising US production. However, this outlook has left the Canadian gas industry searching for an alternative source of export revenues, with the Asian LNG market being the obvious source of demand. The Canadian government has provided significant support for the establishment of a gas export industry in British Columbia, and the potential construction of up to four plants with a total liquefaction capacity of over 40 bcm/a demonstrates the possible size of LNG exports by 2020. Gas would be sourced from the unconventional gas resources that are currently being explored and developed in the Horn River and Liard Basins and piped up to 800 km to the west coast before being shipped the relatively short distance to the main Asian markets.

However, a number of obstacles are appearing that may delay or even permanently interrupt the potential for some or all of the Canadian projects from proceeding. Firstly, the Canadian government's attitude towards its Asian neighbours has been called into question following the recent investigations into CNOOC's bid for Nexen Energy and Petronas' bid for Progress Energy. Although both bids have now been approved, the Canadian Prime Minister's somewhat sobering caveat that 'this is not the beginning of a trend, but rather the end of a trend' has left some market participants questioning Canada's commitment to its potential Asian customer base. Secondly, the prevalence of unconventional gas as a major feedstock has raised environmental questions about Canada's potential LNG export industry, which have been compounded by the need to build extensive pipelines through virgin territory currently owned and populated by native Canadian tribes. The negotiations to resolve land rights and environmental permit issues could significantly delay any projects. Finally, the fact that all of the Canadian projects are greenfield schemes with a relatively high capital cost means that, although they will benefit from short transport distances they will still not be the cheapest gas available in Asia. To date this fact has also been compounded by the demands of the Kitimat project partners for oil-linked gas prices that would clearly put the cost of Canadian LNG on a par with other higher cost producers. Overall then it would seem that, although the commercial logic for Canadian gas exports to Asia is strong and has attracted a number of key industry players such as Shell and Chevron to participate in projects alongside potential

Table 1: The delivered Cost of US Gas to Europe and Asia at various US Gas Prices (US\$/mmBtu)

Henry Hub Price	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
Liquefaction	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Transport to Europe	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Transport to Asia	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Regasification	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Full cost Europe	6.6	7.6	8.6	9.6	10.6	11.6	12.6	13.6	14.6
Full cost Asia	8.4	9.4	10.4	11.4	12.4	13.4	14.4	15.4	16.4

Source: Henderson, J., October 2012, "The Potential Impact of North American LNG Exports", NG-68, OIES

Asian customers such as PetroChina and KOGAS, progress towards physical exports may be slower than the industry in Canada might have hoped.

In conclusion, then, the recent price differentials between North American gas prices and those in Europe and Asia have encouraged a broad energy industry initiative to create export opportunities for US and Canadian gas. Although only one US and one Canadian project currently have full export and construction approval, many others have applied for licences or been proposed, with a potential overall impact that could swamp the current global LNG market. Politicians in the USA are very concerned about the impact that any exports could have on their domestic gas price and as a result on the US economy, with the consequence that an extensive review process is now underway which is unlikely to reach any definitive conclusion until later in 2013.

However, international trade theory suggests that the politicians should not be overly concerned, as the interaction between gas markets is likely to find an equilibrium price that will not be far

removed from the price that would be needed in any case to sustain US gas production. In fact, at the \$5–6/mmBtu price that most commentators believe will be needed to make US gas producers profitable, gas exports to Europe immediately become less interesting. Indeed the most obvious influence of potential US exports based on this level of Henry Hub prices could be to provide a benchmark price of \$9.5–10.5/mmBtu for Europe's higher cost suppliers such as Russia, who would have a clear signal as to the price below which they would likely exclude a new rival source of supply or above which they would encourage its arrival in Europe. On the other hand physical exports to Asia look much more likely, as North American gas exports would remain competitive with the oil-linked LNG contract price even if Henry Hub prices jumped to \$8/mmBtu.

The implication, therefore, of North American gas exports to Asia is that higher cost sources of imports will be pushed down the supply chain, reducing the marginal cost of gas in the region. The situation could be complicated by a

number of other factors, such as increased demand if prices stay low or the introduction of new indigenous production such as shale gas in China, which could certainly reduce the volumes of North American gas arriving in the Asian market. However, even if actual volumes are small, the impact of North American gas, and in particular that produced or purchased directly by consumers in Asia, may be as much psychological as physical. The introduction of gas at prices set by supply, demand and the cost of production, rather than based on a link to an alternative fuel, is likely to increase the focus on cost-of-supply-related rather than oil-related pricing. While it would probably be wrong to suggest that the oil link will disappear completely, given that oil is a competing fuel in some markets and has been used as the basis of contract negotiations for decades, nevertheless it would seem to be likely that, while the introduction of North American gas exports may not have as dramatic an impact on global gas prices as expected it could significantly change the way in which prices are negotiated. ■