

# Competing for LNG demand: the pricing structure debate



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The shale gas revolution is driving a dramatic restructuring of global natural gas markets, not only creating hopes for replicating the Canadian and US successes in similar shale formations outside North America, but also creating opportunities and incentives for moving “surplus” lower-cost Canadian and US natural gas into higher-value global markets via LNG exports.

But LNG is a global game – and Canada’s not the only country looking to cash in.

Canada boasts distinct advantages over competing countries, including world-class resource abundance, geopolitical stability and transportation proximity, but many factors play against the country as well. Companies must manage project and infrastructure costs, liquefaction and shipping costs, the ability to create integrated projects where off-takers can also hold equity gas positions to effectively hedge supply costs, the speed at which projects can obtain all the requisite regulatory approvals, an evolving fiscal and tax regime in BC, skilled labor shortages and, on top of all that, First Nations and environmental challenges. Many also perceive Canada as a high-cost jurisdiction – given past experiences in the development of the oilsands.

Sound complex? It is. All of those factors have to be resolved in a highly competitive global market where contract pricing continues to quickly evolve as new projects seek to gain their place.

Demand customers are seeking to diversify their supply contracts and Canada is well positioned to benefit. The pricing structure debate is heating up as more projects seek – and receive – export approval. LNG consumers are attracted to low North American natural gas prices but LNG developers need strong pricing to generate sufficient returns.

## Where Canada stands

Fifteen Canadian LNG export projects have been proposed and another two dozen have been proposed in the US. Seven US projects, with a total of about 9 bcf/d of export capacity (equivalent to more than 12.5% of current US natural gas production) have received full export approvals. Approved export project capacity could top 10 bcf/d by the end of 2014. One of the approved projects is already under construction, with first exports expected in late-2015. Seven Canadian projects have already received export permits with the expectation that many more will be approved (with a view that ultimately the market and not the National Energy Board will determine which projects are viable). In total, current proposed Canadian projects represent more than the equivalent of Canada’s current daily production of almost 14 bcf/d. Clearly, all projects will not proceed.

Though the proposed US projects are “transportation disadvantaged” on a relative basis, they have significant cost advantages being brownfield projects that will leverage existing LNG import infrastructure, including marine jetties, storage capacity, pipelines and utilities. Many will also have tackled important regulatory and permitting challenges.



## Ongoing challenges

### Uncertainty around potential demand for North American LNG:

- ▶ The huge amount of new global liquefaction capacity that has been proposed or is under construction in many markets including North America, Africa, Australia and Russia – all lead to the increasing risk of destructive competition
- ▶ The uncertainty around future Chinese gas supply and the country's marginal need for LNG imports – i.e., domestic shale gas production versus pipeline imports from Central Asia, Myanmar and Russia versus imported LNG
- ▶ The uncertain Russian response to increasing European gas demand and the threat of lower-priced LNG imports from North America or elsewhere - i.e., how far Russia might go to keep or grow its European market share (and given recent events, will European customers even want to increase their reliance on Russian gas)
- ▶ The impact on future LNG demand resulting from the ongoing efforts to restart the Japanese nuclear energy program

### Opposition to LNG export projects:

- ▶ In Canada, where all projects are greenfield and all impact First Nations communities and face environmental challenges, support from those First Nations and environmental groups will be critical in order to allow any developments to proceed.
- ▶ In the US, some groups – in particular, gas-intensive industries – assert that gas exports will cause a material increase in domestic gas prices, an increase that could stifle the US industrial “renaissance” that is currently underway and has largely been underpinned by low natural gas prices.

The opposite is true in Canada. Proposed Canadian projects have a distinct advantage when it comes to transportation proximity to Asian demand markets. However, the infrastructure challenge is also much more pronounced for Canada's greenfield projects. That's just one of the challenges that will prevent all projects from getting the green light.

The key story is that costs of supply will matter – both for North American projects and globally. And before any of the LNG consumers get too comfortable with the prospects for a dramatic increase in LNG supply, there are several overarching uncertainties with regard to these proposed new supplies that need to be considered.

The most dynamic issue and question around potential Canadian and US LNG exports is the effect they might have on global LNG contracting or pricing structures. Could the availability of lower-priced LNG cargos, priced on a spot or hub-basis rather than an oil-linked basis, exert significant pressure on oil-linked sellers and could we see some convergence in regional gas prices? Will pricing structure uncertainty prevent the entire LNG industry from realizing its potential and as a result, leave Canadian natural gas stranded?



## Pricing flexibility will emerge

The last few years have seen a record divergence in regional gas prices, driven by both supply and demand factors, including the US shale gas boom, the European financial crisis and the Fukushima nuclear crisis. In addition to regional price differences for natural gas, the oil and natural gas price differential has dramatically decoupled from an “energy-equivalency” basis. The advent of diverse potential new supply sources is challenging the LNG status quo, with Asian buyers presumably looking to modify or possibly replace their long-standing and relatively expensive pricing model of gas prices tied explicitly to oil prices.

Typically, high LNG development costs have generally required ironclad long-term off-take agreements – agreements that have historically been oil price based. Recent high oil prices and oil-indexed LNG contracts have resulted in high LNG prices for Asian buyers that – to those buyers – appear much higher than what North American natural gas prices would suggest should be the case. The market is now witnessing the inherent conflict of increasingly more expensive projects trying to sell to increasingly more price-sensitive buyers. High oil prices and low natural gas prices (in North America, at least) have strained the traditional “oil-indexation” LNG pricing approach. Asian buyers assert that oil-indexed LNG prices are untenable, while LNG project developers argue that contracts based on the current low North American price for natural gas will not create acceptable project economics (or support the further development of unconventional gas resources).

In theory, oil indexation of gas contracts will become more difficult with greater competition between sellers, more price-sensitive buyers, growing energy deregulation, more gas-on-gas competition from new pipeline infrastructure, increasing spot market liquidity and, most importantly, increasing availability of spot-price-based LNG exports. Developers of higher-cost projects will find it more difficult to protect their returns through contracts that do not reflect the realities of spot price pressures.

More realistically however, the current supply side of the LNG business – including most, if not all, projects under construction – needs to be assured that it will be able to

achieve a netback (i.e., after shipping costs) of about US\$10 to US\$11 per million BTUs, or about US\$12 to US\$13 per million BTUs delivered. Given a broad assumption that long-term oil prices average between US\$80 per barrel to US\$90 per barrel, this would imply that sellers would seek oil-linked contracts with slopes in the range of 14% to 16% – approximately where they currently are. But the possibility of spot gas-linked contracts from North American LNG could upset the traditional pricing structure. Using the notional terms of some of the proposed US export contracts, the attractiveness of “Henry Hub plus” pricing becomes apparent, both to buyers and sellers: buyers accessing supply not linked to high oil prices, and sellers opening margin opportunities compared to domestic North American markets.

## Where do “spot” and “oil-indexed” prices converge?

The charts on the next page are intended to set out a simple comparison of the deemed prices for LNG cargos from North American LNG projects at a variety of oil and natural gas price points on an “energy equivalent” basis. For example, US\$5 per million BTU Henry Hub natural gas prices translate into US\$10 to US\$13 LNG prices into Asia (after accounting for liquefaction and transportation cost estimates) which on an energy equivalent basis equates to oil prices ranging from US\$60 to US\$75. Thus, buyers who have access to lower-priced US LNG would have attractive supply alternatives and could capture some of the implied margin/arbitrage, and/or these buyers would have some leverage with oil-linked sellers, as long as those oil-linked prices for LNG were above the nominal energy equivalent price range.

Alternatively, current Asian LNG prices in the US\$16 to US\$18 per million BTU range (calculated on an oil-indexed basis) suggest that buyers would be willing to buy at implied Henry Hub natural gas prices in the US\$8 to US\$10 range. Thus, LNG sellers (either producers or portfolio players) with access to supply at prices below this implied energy equivalence level, could seemingly capture some of that margin/arbitrage.



In short, for both LNG buyers and some sellers, the arbitrage opportunity available by linking to current Henry Hub spot prices (and in fact against many of the longer-term natural gas price forecasts which remain in the US\$4 to US\$6 range) is clear.

Our notional costing model reflects the terms of the early US LNG export projects, all of which are brownfield projects that leverage many of the sunk costs from those projects' earlier lives as LNG import facilities. While we use an uplift factor of about US\$7 per million BTUs for Gulf Coast LNG to Northeast Asia, to account for liquefaction and transportation, this amount may be insufficient to cover the costs of the proposed greenfield projects, and it may not be sufficient to cover any or all necessary costs upstream of the spot-hub.

Given that all Canadian projects are greenfield projects requiring significant infrastructure investments, the notional FOB costs for proposed Western Canada LNG exports are assumed to be modestly higher than those for US Gulf Coast exports. However, it is expected that shipping costs to Asia will be lower as a result of the significant "distance advantage" enjoyed by the West Coast projects. At the present time, it is unclear whether/how the full upstream costs of Canadian LNG will be reflected in LNG prices, as

opposed to simply basing prices on spot prices similar to the merchant US projects.

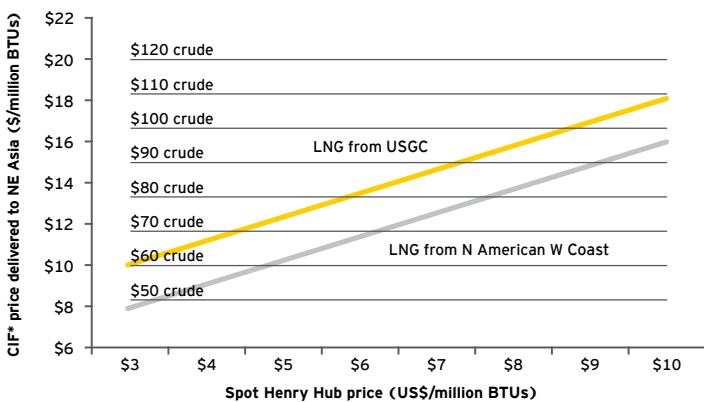
As substantial volumes of lower-cost LNG move into Asian markets, projects at the high end of the supply curve – namely, many of the Australian projects – will become increasingly vulnerable, with at a minimum, situations arising where sellers may be forced to re-open or renegotiate contracts.

A similar analysis for shipments into Europe from the US Gulf Coast shows the implied pressure that spot-based contracts could put on oil-linked sellers. As shown below, US LNG at US\$5 per million BTUs would remain competitive with oil-linked contracts down to about US\$60 per barrel.

Spot pricing increases buyers' choices, adds liquidity to markets, and allows buyers to hedge financially and physically. The historic justification of oil linkages was the security of supply, but with increasing liquidity in the LNG market, some of the security "premium" becomes harder to justify (and perhaps unnecessary). Growing liquidity also gives suppliers confidence to sanction projects before locking in off-take agreements – resulting in the emergence of major portfolio LNG players.

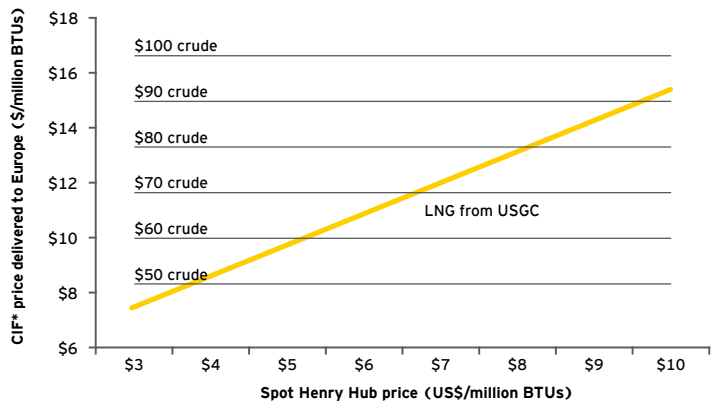
### Competitive gas pricing: oil-linked versus spot

(delivered to NE Asia)



### Competitive gas pricing: oil-linked vs. spot

(from US Gulf Coast to Europe)



\* Costs, insurance and freight

Source: EY analysis



## How is the market responding?

Some LNG buyers have already signed contracts for future US-based cargos at Henry Hub-linked prices. These volumes are a fairly small part of their gas supply portfolio (generally less than 20%). While these volumes appear very attractive at the margin, they are likely less well-suited for base-load supply. It's important to recognize that hub-based exports may not always be cheaper. North American gas prices can be extremely volatile. Looking back 10 to 20 years, there are many periods where spot natural gas prices were higher than oil prices on a BTU-equivalent basis. While the structure of both the oil and gas market may have changed over that period, it would be unwise to dismiss the risk of that recurring in the future. While greater contract flexibility is certainly a big attraction, spot pricing may simply interject more volatility for buyers and cause project developers to have higher internal return thresholds to account for that volatility risk.

There is also the critically important question of whether Canadian and US shale gas development can be sustainable over the medium or longer-term at under US\$5 per million BTUs (which is above current prices), given the expected increases in costs associated with increasing decline rates and increasing re-investment demands. The whole debate over Henry-Hub pricing versus some form of oil-linked price contracts appears to sometimes lose track of the current market pressures – which, some pundits argue, is downward for oil prices, given supply/demand issues, and upward for North American natural gas prices, given cost pressures and the need to earn some minimum return on capital.

Concurrent with the expanding role of the portfolio LNG players, we are seeing increasing potential for destination flexibility in LNG contracts, increased “diversions” of cargos between markets and increased re-exporting of cargos, all of which increase liquidity and contribute to greater linkages between regions and markets. These new linkages between markets and the growing supply-side competition for premium Asian customers will provide some convergence of regional prices. Asian prices will be pushed down, while North American prices will increase somewhat, generally narrowing, but not eliminating, the regional differentials.

Going forward over the medium to longer-term, we expect to see a gradual but only partial migration away from oil-linked pricing to more spot or hub-based pricing. We don't expect to see a paradigm shift in pricing. Oil-linked pricing will not totally go away, but we do expect to see more pricing alternatives in all markets and, in general, increased contracting flexibility. We are also likely to see some lowering of contract “slopes,” which has the effect of reducing the oil linkages and essentially moving closer to equivalent gas prices, and see buyers using spot-priced volumes to exert pressure on existing contracts through contractual reset mechanisms.

LNG sellers are reluctantly facing realities and are offering concessions in order to remain competitive. There will always be competitive pressures from new suppliers, and at the same time, buyers will always look to obtain the lowest-cost, least-risky supply, with the explicit understanding that security of supply is of high strategic value but comes at a cost.

Even if Canadian and US natural gas prices remain, as expected, relatively low, LNG prices are unlikely to collapse. For most LNG projects, the cost to supply is high and incentives to develop new capacity must be maintained. LNG is a very expensive and capital intensive game, and prices – however they are formed – must reflect this reality. New LNG projects – which buyers point to as ensuring LNG prices will decrease – will not proceed unless developers can make their economics work.

# What's next

Staking a claim in today's growing LNG demand market means competing for capital on the world stage. Canadian projects have their advantages but will need to take a proactive approach to managing the number of ongoing challenges influencing competitiveness. This goes well beyond tax and fiscal policy considerations. Resolving uncertainties in the regulatory framework, securing First Nations support, ensuring sufficient natural gas reserves are delineated to support the long-term nature of the LNG export facilities and clarifying (and effectively managing) project costs will be key to evolving the Canadian LNG opportunity from promise to reality.

Stay tuned. It's going to be an exciting time for Canada and the global LNG industry.



**Dale Nijoka**

EY Global Oil and Gas Leader  
dale.nijoka@ey.com



**Barry Munro**

EY Oil and Gas Leader – Canada  
barry.g.munro@ca.ey.com



**Foster Mellen**

EY Global Oil and Gas Sector Center Senior Analyst  
foster.mellen@ey.com

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