

# Pathfinder Forum Report

A global perspective on the impact of North American LNG



## How much US LNG?

Everyone's first question: how many projects and which projects will get sanctioned? Crystal ball gazing doesn't get us very far, but considering some of the enabling or inhibiting factors may. Developers in the US are universally bullish – find offtakers/capacity takers; get their permits; get financing; build plant... build it and they will come... But how much can the market – for LNG and, more pertinently perhaps, for money – take? And how much exposure to US LNG and its particular risk profile is too much exposure – for buyers, for lenders?

Fundamentally of course economics play a massive part – US LNG only remains viable if the costs look good. Brownfield conversions and new technologies for liquefaction seem to be providing very competitive liquefaction costs, but \$5 isn't that cheap for feedgas into an LNG plant. If that dial starts to turn up, things may begin to look different quickly.

All prospective US export projects are not the same of course. There are clear differences between brownfield and greenfield projects; the specific location, technology choices and capabilities of developers will likely all play a role in influencing viability.

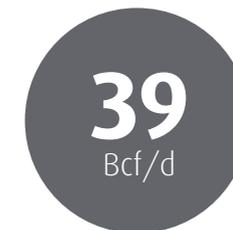
# Taking the temperature of global LNG: The impact of the US phenomenon

Over the period November 2013-February 2014, Gas Strategies hosted a series of roundtable conversations of the LNG industry in London, Houston and Singapore.

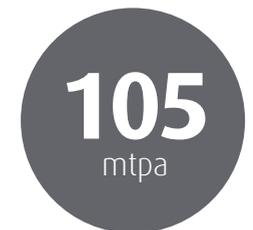
Throughout, the market has continued to evolve and develop. This summary document captures the significant sentiments and observations of those conversations.



lodged with US Department of Energy (including for expansions)



of export capacity applied for with DOE (approx. 300mtpa)



of offtake agreements (of varying maturity) announced

(as at 13 March 2014)

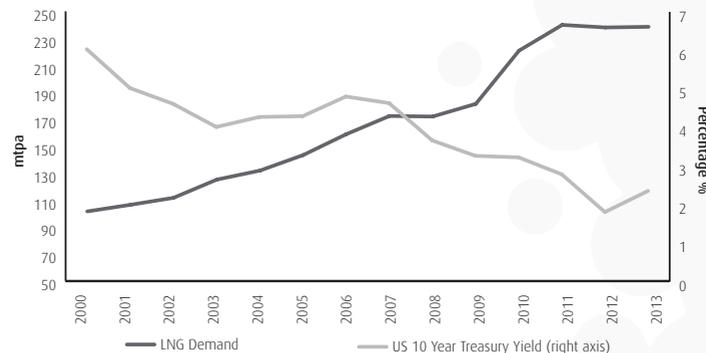
## Finance

The typical development profile of US LNG projects is unlike anything previously seen in LNG. As one developer put it, “we are in the business of building very large refrigerators on the beach”. Risk is piled onto the offtakers for the purpose of financing and the identity, creditworthiness and capabilities of those offtakers will determine the capacity to finance and the means of finance. Developers are seeking to insulate themselves from market risk – but in reality, they will remain exposed to changes and challenges in the wider LNG and gas world.

Lenders may view the availability of a “sink” market in North West Europe as a critical risk mitigant, but an oversupplied world, with distressed volumes, could see volumes holding that price low whilst the Henry Hub price creeps up.

Developers of US projects are already engaging with atypical or new LNG buyers: equity investors and lenders are considering the particular risk profiles that emerge as a consequence and the structure and cost of finance follows accordingly. Many in the financing community are unfamiliar with “standard” LNG and understanding the risk profile of these new project forms is a further challenge.

Investors have had to look away from traditional sources of return at a time of impressive LNG market growth.



## Not LNG or New LNG?

How projects are structured to parcel risk, how money is borrowed and equity is raised, need to be carefully appraised and taken in context of prevailing market evolution: both as a result of US LNG volumes and of what else happens in the world.

Access to viable – financeable – offtakers and to money through a variety of different routes will be a significant pacesetter of US LNG project development. Getting FERC and DOE non-FTA approvals are prerequisites but may not be the critical elements.

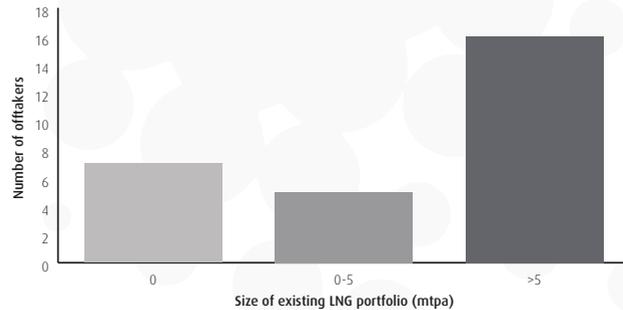
The sponsors, the structures, the approaches to financing all challenge prevailing LNG practice and norms. US LNG can open the door to new participants (sponsors, buyers of LNG, lenders) and if they can find a way to raise the capital and sell the LNG, we could see a significant influx of new members to the once exclusive Club LNG.

Traditional drivers for LNG project development: namely monetisation of large (often stranded) gas resources are not in play here in the same way. In Canada yes, but not in the US. The abundance of cheap gas and the price discrepancy between the US and other markets create a seemingly irresistible market opportunity, as long as the necessary infrastructure (to connect those two prices) is constructed. Gas is abundant and available at a traded and transparent price. The impetus here comes from infrastructure developers (often with little or no LNG experience) and LNG buyers: especially those that have long-sought a foothold in the potentially lucrative LNG midstream market.

## Disruption & acceleration

US LNG will provide a significant slug of new LNG into the market in the next decade and, although most offtakers will surely seek to mitigate market and price risk by placing volumes long-term into identified markets, it will inevitably increase the liquidity and depth of the traded, divertible LNG market. With sponsors uninterested in the chain downstream of the plant, and with the vast majority of facilities likely to be tolling models, destination is at the buyers' discretion and there are no profit-sharing mechanisms. These contracts could be high-value additions to an LNG portfolio (assuming the HH price is right and the market available of course).

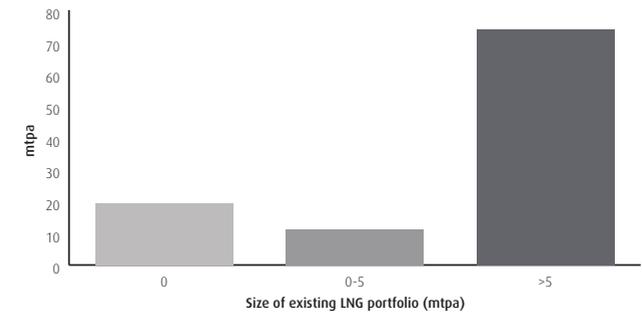
Number of offtakers by size of existing LNG portfolio.



Transparent connection with US gas prices adds a challenging dynamic to the market – volatility of gas costs adds to the overall volatility of short-term LNG pricing and may also disrupt long-term contract pricing elsewhere. Already we see the ingress of HH pricing into non-US long-term contracts and breath is being held to see what impact it may have in price reviews for existing long-term contracts in the coming decade.

Asian buyers are using US LNG volumes to provide diversity (of source, of price) but also to catalyse changing portfolio approaches. As for traders and some others, the US can provide additional volumes into a portfolio which can be

Proposed LNG offtake from US projects by existing portfolio size.

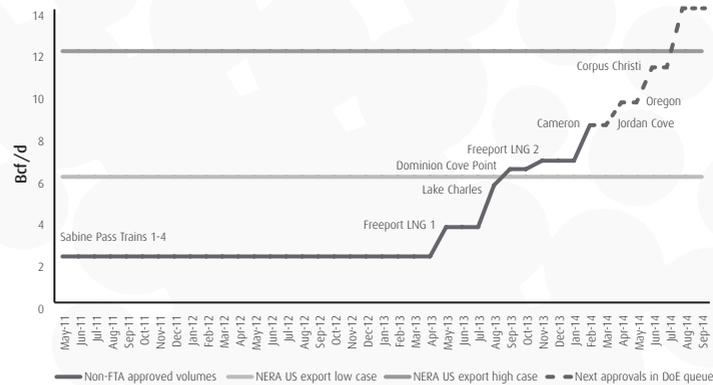


actively managed for value. The role of US LNG in augmenting or building a portfolio is evident in the fact that the first wave of offtakers from the US is dominated by established aggregators (partly no doubt looking to be able to offer different pricing to their customers) and Asian buyers who want volumes for their markets and maybe also to increase the flexibility within their portfolio.

With no destination restrictions, (somewhat) hedge-able supply costs and ultimately the ability to not liquefy, US volumes bring excellent flexibility mechanisms. Whether a toller would choose not to liquefy except in extreme circumstances (given the >\$3/MMBtu cost) is, however, questionable.

The nature of the US LNG surge has created opportunities for new contractors, technology providers, and (smaller) scale of liquefaction train/project: it is acting as a petri dish for new participants, new technologies and new approaches. Should the US contribute to LNG oversupply, and should volumes from there not be long-term contracted into a higher value market, it may create impetus for rapid development of "additive" LNG chains (marine fuel; bulk breaking; small scale distribution) by providing access to LNG and suppliers seeking to add value to their value chain.

The DOE will soon have approved >12Bcf/d of non-FTA exports.



## The Big Picture - scenarios

The US will be the third “mega-wave” of LNG supply (following Qatar and the one currently being built in Australia) but it has little in common with either. It is the child of a the unique shale gas revolution of North America rather than a means of monetising stranded gas; it is not part of a managed and directed plan of national interest and includes few of the establishment.

New US LNG capacity is not being developed in a way the LNG market historically would recognise: and it will alter the way the market functions forever. But how different will things really look in the future?

### The corpses of white elephants litter the beaches of the USA...

The market moves against US LNG exports – the HH price goes up or politics intervenes – and the tens or hundreds of billions invested in liquefaction plants is wasted as they lie idle or underutilised. Alternative sources of gas satisfy European markets; Asian buyers continue to support development of projects elsewhere (favouring their more predictable costs). Capacity holders, offtakers and financiers get

their fingers burnt and swear off LNG for all time. And we remind ourselves once again that the US gas market is always unpredictable...

### The tipping point: the supply that changed the LNG industry forever

Transparently priced US LNG provides a pool of LNG which encourages increasing numbers of participants, further trans-continental price communication (a single price for short-term LNG) and eventually also changes long-term contracting...

A global LNG market emerges, with a conveyed price and with financiers happy to use that price as the basis for financing new plants (even if they still need an entity that will pay for it).

### Same old same old

US LNG happens to a modest (or even immodest) extent but does little other than add volume to the global market which is still largely controlled by established players and which requires solid credit-rating and capability to persuade banks to part with their cash. Pace of development is gentle and US projects provide an alternative for buyers but one which they choose not always to take. Long-term LNG pricing becomes more complex and varied, but oil and gas-linked prices coexist and there is no emergence of single global pricing or an oil-style traded market.

Three scenarios - extreme and equally unlikely perhaps but nevertheless possibilities for how this might all play out. Transitional markets are inherently unstable and this unique situation may tend towards an extreme outcome. But at this stage, based on the mixed sentiment of those that participated in the Pathfinder Forums,

## New challenges

it seems impossible to be sure. The next 18 months may reveal much...

### **For developers**

Using new technologies, contractors and engaging new customers, projects will work hard to ensure they can structure a financeable project and one which can be delivered at an acceptable risk. Educating lenders, customers and other stakeholders will be critical.

Operating multi-user facilities may be relatively straightforward in principle, but with highly complex corporate structures used to optimise the assets, there will be significant contractual complexity that will need to be operated.

For brownfield projects, with pre-existing and valuable regasification contracts, sustaining the bidirectional nature of the facilities in the face of (regas) customers looking for a way out will be a challenge they are highly incentivised to manage.

### **For offtakers**

Know thy risks. US LNG may look like a sweet shop but it brings those that engage with it exposure to complex and global set of market risks. Finding effective ways of managing these risks will be vital.

The requirements for management of gas to the liquefaction plant should also not be underestimated. The US gas market is large and liquid – true. But gas still has to be bought and delivered to the plant. This requires people operating in the market for both gas and transportation and managing the required variations. Even if an offtaker wants to fill their toll capacity every day and has reserved

capacity in the final bit of pipe to the plant, they will need a mix of longer term and down to daily arrangements to balance their requirements.

For this and other reasons (downstream of the plant), US LNG will spur an enormous requirement for capability – many organisations will be doing things they haven't done before (or done in the same way). The organisational and personnel challenges will be significant. Finding good, experienced people and reshaping organisations to be able to manage these businesses will be crucial to success. Australia sits as an example of the cost risk of such an LNG gold rush.

### **For financiers**

These are not conventional LNG projects and they don't have conventional market risks associated with them. New lenders and equity investors are already being attracted to these projects and ensuring they lend or invest only with a full understanding of the risks – including market risks – is critical.

US LNG provides unprecedented equity investment opportunities and could offer very attractive returns – infrastructure funds may find a lot that they like in these projects but should be wary of ensuring appropriate due diligence is undertaken.

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