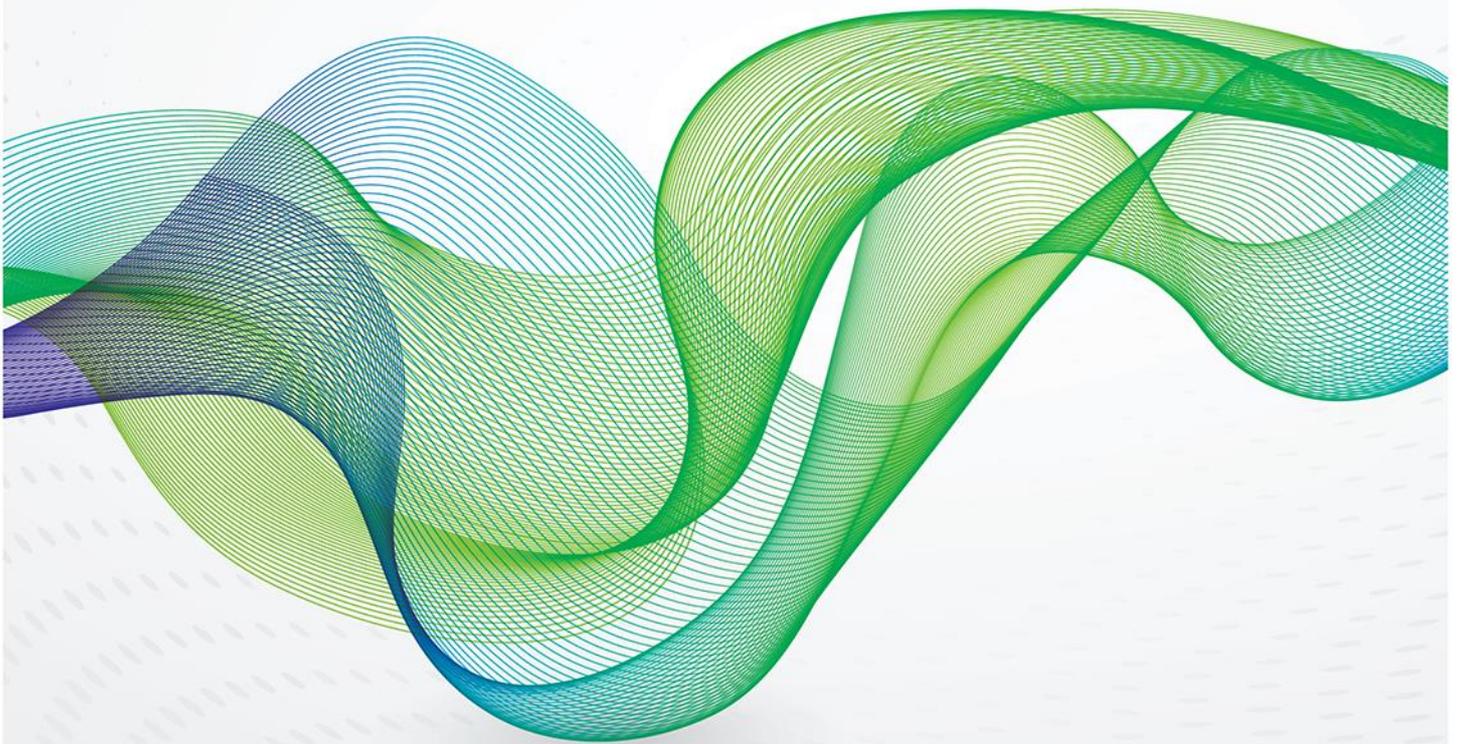




THE OXFORD
INSTITUTE
FOR ENERGY
STUDIES

April 2017

Qatar Lifts its LNG Moratorium





Background and Introduction

Following its capacity expansion in the late 2000's, Qatar became the world's largest LNG supplier. This was not without trauma: export volumes targeted at the US market were, due to the shale gas boom, not required by the time new capacity had been commissioned, and demand in European and Asian gas (and LNG) markets was hard hit in 2009 by the financial crisis. Adapting nimbly to the new market reality, Qatar was able to secure markets for its LNG output as Asian demand rebounded from 2010 onwards, exacerbated by the Fukushima disaster of March 2011.

Subsequently, strong Asian LNG demand growth and price signals from (oil indexed) contract LNG prices and LNG spot prices, supported by a 'tight' post-Fukushima market, have triggered LNG project FID's notably in Australia and the USA, but also in Russia. With projects already commissioned and under construction, Australia is set to eclipse Qatar as the world's foremost LNG supplier by 2020.

Qatar's moratorium was announced in 2005 to allow an analysis to be made of the North Field's performance but this has been extended on a rolling basis. In 2014 it was stated that a comprehensive evaluation of all the reservoir, well data and models was continuing in order to develop the optimum strategy for the long-term future of the field.

An OIES – Columbia paper¹ noted the advantageous economics of Qatar LNG projects due to the high condensate and LPG co-production with feedgas from the North Field, and also the impressive track record of project execution. These resulted in a low effective LNG break-even price which no other current LNG exporting country could challenge in terms of new project economics. This said, the apparent schedule and cost overrun on the Barzan project and its apparent lower condensate and LPG yield per bcm of gas production prompts a re-appraisal of this position.

The Current LNG Market Situation

As assessed in a recent OIES paper², 2017 marks the year when the growth of new LNG supply from Australia and the US will exceed demand growth from Asian and other markets, resulting in at least a soft LNG market and in all likelihood a 'glut' of supply. This is expected to clear by the early 2020s, however, with LNG supply from new projects required by the mid-2020s (with flexible Russian pipeline supply upside to Europe bridging the gap). With the lead time between FID and first LNG production being typically five years, one would expect that, despite the current glut, sponsors of projects for the next wave of supply will be:

- Divining the underlying trend of Asian LNG demand growth – as the range of uncertainty on this represents an 'uncertainty window' between 2023-2026 in terms of new LNG supply needed beyond current projects in development, post FID.
- Strenuously seeking to cut projected costs in order to improve investment case economics.
- Struggling to cope with the implications of the preference of Asian buyers to move away from oil-indexation and towards shorter contracts and diversion flexibility.
- Benchmarking their own projects with respect to the competition in the context of the perceived market requirement for new LNG supply in what is an uncertain future for gas consumption growth in both the regional and the global energy mix.

Against this background, an announcement from Qatar that it intends to re-engage in new LNG projects by lifting the moratorium on North Field development is expected to disconcert project sponsors struggling to improve FID price break-even economics.

¹ The US Shale Gas Revolution and its Impact on Qatar's Position in Gas Markets, B. Fattouh, H Rogers, P Stewart, March 2015, <https://www.oxfordenergy.org/publications/the-us-shale-gas-revolution-and-its-impact-on-qatars-position-in-gas-markets/>

² 'The Forthcoming LNG Supply Wave: A Case of 'Crying Wolf', H Rogers, OIES, February 2017, <https://www.oxfordenergy.org/publications/forthcoming-ling-supply-wave-case-crying-wolf/>

Relative competitiveness

In order to establish a contemporary estimate of Qatar's competitiveness we can analyse the Barzan project, (developed to supply domestic gas requirements and within the scope of the moratorium) which was undertaken as a joint venture between Qatar (93 per cent) and ExxonMobil (7 per cent), and was announced in January 2011³. Initially expected to cost \$8.6 billion and to be onstream in 2014, the project schedule has slipped and costs have risen. Later reports state that the end-2016 start-up has been further delayed due to gas leakages from an upstream pipeline⁴.

As detailed in a 2016 article⁵, the \$10.3 billion scope will, when all phases are complete by 2020, add 6.2 bcf/d to Qatar's production and 28 mbd of condensate, 6 mbd ethane, 10.5 mbd of propane and 7.5 mbd of butane. Of immediate note is the much lower condensate yield when compared with earlier projects. The Rasgas 2 and 3 LNG train projects yielded almost 10 times the quantity of condensate per unit of gas production. Whether this is a reflection of the variable nature of the North Field reservoir (a heterogeneous carbonate formation) or inaccurate reporting is at present unknown.

Taking the project data at face value as representative of future North Field LNG feed gas projects (on a unit cost basis) and adding a liquefaction plant at an assumed \$700/mtpa⁶, the break-even destination market LNG price for a new Qatar LNG plant would be \$5.2/mmbtu⁷. Although this is higher than the general perception of Qatari break-even prices it still compares very favourably with the full-cycle break-even price of new US LNG projects (estimated at Henry Hub plus \$4 or \$5/mmbtu) or other non-US green field projects (in the range of \$9 to \$12/mmbtu). It is also in line with the short-run cost of supplying Russian pipeline gas to Europe. If, as a consequence of inaccurate data reporting, the condensate (and other co-product yields) were more in line with the Rasgas projects mentioned above, the destination market break-even price of new Qatari LNG projects would fall to below \$2/mmbtu.

Implications for the LNG market

Qatar sees new (LNG) production from the North fields starting within five to seven years and has indicated a target export volume of 2 bcf/d (20.7 bcma)⁸. As global LNG demand grows beyond the projected supply from existing projects under construction, the world will require new supplies around the middle of the 2020s, in addition to the mooted Qatari new volumes. Given the relative cost-base advantage of new Qatari LNG projects, this will increase the competitive pressure on projects in more expensive locations. The current soft LNG market and fears of an impending 'glut'⁹ has created lowered price expectations, demands for increased contract flexibility and uncertainty over future LNG contract price formation mechanisms – especially in the dominant Asian importing markets. As the market rebalances, new supply projects will need an expectation of price levels which remunerate full-cycle investment. This may take some while to mature, given the recent apparent lack of enthusiasm for an offer of a fixed price \$8/mmbtu for delivered LNG from 2023 from Tellurian Inc¹⁰.

Although Qatar is in prime position to compete with any of the established LNG exporters (as well as Russian pipeline gas) now that it has lifted its North Field moratorium, it will no doubt find the LNG

³ 'Qatar Petroleum and ExxonMobil sign \$8.6bn Barzan gas project deal', Energy-pedia news, 6 January 2011, <http://www.energy-pedia.com/news/qatar/qatar-petroleum-and-exxonmobil-sign-usd8-6bn-barzan-gas-project-deal>

⁴ 'Gas leaks plague Barzan project', The Oil and Gas Year, October 18 2016, <http://www.theoilandgasyear.com/news/gas-leaks-plague-barzan-project/>

⁵ 'Greener Fields: Focus: Barzan Gas Project, the business year, Qatar 2016,

⁶ See 'LNG Plant Cost Escalation, Brian Songhurst, OIES, February 2014, NG 83, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/02/NG-83.pdf>, P 22

⁷ Assuming an IRR of 12 per cent, an LNG shipping cost of \$1/mmbtu, regas cost of \$0.4/mmbtu, condensate price of \$50/bbl, ethane price of 30 US cents/US gallon and LPG (propane and butane) price of \$375/tonne.

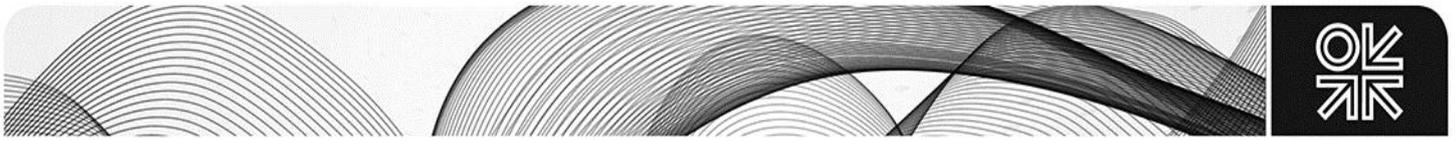
⁸ 'Qatar Restarts Development of World's Biggest Gas Field', Reuters, April 3 2017,

<http://www.foxbusiness.com/markets/2017/04/03/qatar-restarts-development-worlds-biggest-gas-field.html>

⁹ See 'The Forthcoming LNG Supply Wave: A Case of 'Crying Wolf?', Howard Rogers, OIES, February 2017,

<https://www.oxfordenergy.org/publications/forthcoming-lng-supply-wave-case-crying-wolf/>

¹⁰ 'Japan LNG buyers wary of Tellurian's fixed-price offer', Reuters, April 6^h 2017, <http://www.reuters.com/article/japan-gastech-lng-idUSL3N1HE1YR>



market decidedly different from that in which it concluded long-term contracts with Asian buyers in the 2000s. The bottom line however is that, after more than a ten-year moratorium, Qatar is back in the business of new LNG supply – in a more fractious market and with future price expectations somewhat foggy.

The question still hovering is 'why now'? Two answers leap to mind. On a 'business as usual' strategic/commercial level, the anticipated 'gap' for new LNG supply from the mid-2020s is an obvious enticement to Qatar. Having made the decision to claim (at least) 20 bcma of that gap (and probably more) it is an inherently sensible move for the owner of a huge, undeveloped, low-cost resource to proclaim loudly its intention to re-engage in the LNG business. In response, competing higher cost projects will either defer or cancel – especially if buyers are less likely to agree to the required (higher) break-even prices in the anticipation of getting a better deal from Qatar.

The second possibility is of a more existential nature. With LNG demand growth already less certain than in the past (in part due to the prevalence of coal and renewables in the planned future Asian energy mix), the prospect of a plateau in gas and LNG demand in a world where there appears no shortage of gas as a resource must be of concern to Qatar. There is however a shortage of supply that can be developed and transported long distances to market, either via LNG or pipeline, for less than say \$7 to 8/mmbtu. In realising this, Qatar may have revised its strategy of conserving its resource 'for future generations' – on the basis that within that timescale the market may be severely constrained.

In conclusion, the recent re-engagement of Qatar in the development of new LNG supplies is potentially good news for consumers, but somewhat worrying for upstream sponsors sitting on inherently high cost competing projects.