

Current Important Topics in the LNG Industry

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Introduction

The year 2014 is expected to be a turning point for the Asia Pacific LNG industry, where new generation of LNG export projects will be starting up one after another. The preceding year saw continuing flattening global LNG trades with languishing demand in the Atlantic region and relatively small export capacity addition, as well as the gravity of the global market continuing shifting to the Pacific region. While expensive LNG prices continued exacerbating pains to Japanese LNG buyers and the nation's economy, progresses were observed in terms of medium- to long-term LNG procurement, including approvals of LNG exports from the United States to countries that do not have a free-trade agreement (FTA) with that country to those LNG projects that assumes Japan as the prospective market, as well as some positive developments with proposed LNG export projects around the world. Those developments along with commencement of operation at several LNG receiving terminals in different countries are driving structural changes in the global LNG market. This article outlines the following eleven developments:

1. Several approvals to export LNG from the United States to those countries that do not have a free-trade agreements (FTA) with the United States - including Japan - granted by the Department of Energy (DoE);
2. Progresses of LNG export proposals on Canada's Pacific Coast targeting the Asian markets;
3. Impacts of elevated costs on Australian LNG projects;
4. Russia's partial liberalisation of LNG exports and new LNG export projects;
5. Japan's record high payment for LNG imports;
6. Changing patterns of short-term procurement of LNG;
7. Stagnant growth of global trades of LNG in 2013;
8. Troubles and inaugurations of LNG export projects in the Atlantic basin;
9. Increasing presence of East Africa as a potential major source of LNG;
10. New LNG terminals and imports in China, Singapore, Malaysia, India, Israel and Indonesia, as well as plans in the Philippines and Myanmar; and
11. Expectations and reality of shale gas development in China and Europe.

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1. Several approvals to export LNG from the United States to those countries that do not have a free-trade agreement (FTA) with the United States - including Japan - granted by the Department of Energy (DoE)

The Department of Energy (DOE) granted combined six licenses to five LNG projects to export LNG from the United States to those countries that do not have a free-trade agreement (FTA) with the United States during the past year, for the first time in two years¹. Among them three projects with four licenses include contracts to bring LNG to Japan, fuelling high expectations in Japan to LNG from the United States. However, uncertainties still remain regarding the final prices and dates of import commencement.

LNG export projects that were granted non-FTA approvals during the past year include:

Freeport LNG, Texas (approved in May 2013);

Lake Charles, Louisiana (August 2013);

Cove Point LNG, Maryland (September 2013);

Freeport LNG Expansion, Texas (November 2013, Only 3 million tonnes out of 10.6 million tonnes applied was approved);

Cameron LNG, Louisiana (February 2014); and

Jordan Cove, Oregon (March 2014).

As indicated in the case of Freeport LNG Expansion, the DOE may not necessarily approve full amount that project promoters ask in their applications. Approvals in a manner and at a timing that project promoters want cannot be taken for granted. Even with timely DOE export licenses, delays in construction approvals from the Federal Energy Regulatory Commission (FERC) and/or cumbersome procedures to line up financing may further delay project implementations. There was only one final investment decision (FID) on an LNG export project in the United States in 2013 - the third and fourth trains at Sabine Pass Liquefaction in May.

Japanese proponents of LNG imports from the United States praise their advantages of potentially lowering procurement prices and diversification of pricing, spill over effects on stronger negotiating positions against LNG sellers from different regions by diversifying procurement sources and enhancing energy security. On the other hand, however, buyers should note that importing LNG from the United States may not directly translate into lower procurement prices, as GDF Suez, for example, has indicated that the

¹ The first non-FTA approval was issued to Sabine Pass Liquefaction in May 2011.

company market LNG from the Cameron LNG project in Asia because the company expects to realise higher prices in Asia than in Europe². In addition, risks accompanied with new supply sources and new procurement models in general should be analysed comprehensively and well taken care of.

2. Progresses of LNG export proposals on Canada's Pacific Coast targeting the Asian markets

Canada has lost a big outlet of its pipeline gas production after the shale gas revolution in the United States. Numerous LNG export projects have been proposed on the Pacific Coast of British Columbia targeting the Asian market (see the table below). Although they have challenges in infrastructure and cost fronts, those projects are making progress toward realisation. The Japanese government has expressed its will to offer technical and financial supports to promote imports of Canadian LNG to Japan.

Table 1: LNG export projects on the British Columbian coast

Project	Companies involved	Annual capacity (million tonnes)	Start year
BC LNG (barge-based)*	LNG Partners, HN DC LNG LP ³ , Golar	1.80	2015
Kitimat LNG*	Chevron, Apache	5 - 10	2016
LNG Canada*	Shell, Mitsubishi Corporation, Kogas, PetroChina	12 - 24	2010s
Pacific Northwest LNG*	Petronas, JAPEX, Indian Oil (IOC), Petroleum Brunei	12	2018
Prince Rupert LNG*	BG	21	2021
WCC LNG*	ExxonMobil, Imperial Oil	5 - 30	2021
Woodfibre LNG*	Woodfibre Natural Gas (Pacific Oil & Gas)	2.1	2021
Triton LNG (floating LNG)	Altogas, Idemitsu	2.3	2017
Aurora LNG	Nexen (CNOOC), INPEX, JGC	24	2021 - 23
Kitsault Energy	Kitsault Energy	4 - 20	2018
Stewart Energy LNG	Canada Stewart Energy Group	5 - 30	2017

*Approved by NEB

(Source) Company information and media reports

Although numerous LNG export projects have been proposed, significantly fewer ones will be realised, given the numbers projected in "Canada's Energy Future 2013"

² "Interview with CEO of the French energy giant who intends to export LNG from the United States to Asia" 12 December 2013, Nikkei Shimbun (in Japanese).

³ A limited partnership established by Haisla Nation

released by Ottawa's National Energy Board (NEB) in November 2013. Amid competition to survive the race, some progress has been observed. Triton LNG acquired a 66.7% stake in Canadian oil and gas company Petrogas Energy in October to effectively secure access to inland transportation networks of gas pipelines, freight cars and road vehicles, that should be more difficult to procure as other project proposals make progress. Aurora LNG - CNOOC's Nexen affiliate, JGC and Inpex - acquired exclusive rights to 1,900 acres (7.7 km²) of British Columbia government land at Grassy Point, effectively edging ahead of the WCC LNG partnership of Imperial Oil and ExxonMobil, Woodside Petroleum, and Korea's SK E&S who had also submitted eligible expressions of interest in the Grassy Point site.

Canadian project proposals face inherent challenges of developing infrastructure for brand-new plants and slow progress of marketing activities. The Japanese government has expressed its willingness to support the projects technically and financially through Economy, Trade and Industry Minister Motegi's meetings with Canada's Natural Resources Minister Joe Oliver in October and with British Columbia's Premier Christy Clark in December. The Canadian side has also agreed to promote development by rendering more streamlined regulatory procedures.

3. Impacts of elevated costs on Australian LNG projects

In Australia, which is expected to be a dominant source of incremental LNG supply in 2014 - 2015 and onwards, upward revisions of construction costs were made for multiple projects in 2012 and 2013, due to rising labour costs and delayed schedules. Reflecting the upward trend of costs in land based projects, several floating liquefaction (FLNG) proposals have been forwarded anticipating relatively lower costs. A few cooperation agreements have been announced between coalbed-methane (CBM or CSG in local language)-to-LNG projects intended to reduce risks related to feedgas supply. In the meantime a new federal administration has taken office with a pledge to abolish the carbon tax.

Woodside Petroleum and its partners in the Browse project in Western Australia agreed in September 2013 on an FLNG alternative due to expected high cost of development of an onshore liquefaction scheme at James Price Point. The FLNG concept is opposed by West Australian Premier, who had expected greater employment opportunities from an onshore project.

GDF Suez has pushed back the production target of its Bonaparte FLNG scheme off the northern coast of Australia by one year to 2019.

ExxonMobil submitted a plan of 7 million-tonne-per-year FLNG scheme based on the Scarborough field offshore Western Australia that it shares with BHP Billiton to the Australian government in April 2013. The government issued an environmental approval to

the scheme in November. Under the scheme at the time of submission, production is expected to start around 2020 - 21.

In December 2013, Chevron revised upward the total cost estimate of the Gorgon LNG project in Western Australia to USD 54 billion from the previous USD 52 billion announced in 2012 and the original USD 37 billion at the time of its final investment decision (FID) in 2009. The company also pushed back the timing of its first exports from the first quarter to the middle of 2015.

Among the CBM-to-LNG projects on Curtis Island in Queensland, GLNG and Queensland Curtis LNG (QCLNG) agreed on inter-connections of feedgas pipelines between the two projects in July 2013. GLNG also agreed with Australia Pacific LNG (APLNG) to connect pipelines between the two in October, too.

The administration of Tony Abbott of the Liberal Party who sworn in after the election victory in September 2013 has revealed its intension to abolish the carbon tax which was enacted by the previous Labour government in July 2012. Although a bill to scrap the tax passed the lower house of the parliament, it is yet unclear whether and when it will be actually abolished as the ruling party does not have a majority in the upper house.

4. Russia's partial liberalisation of LNG exports and new LNG export projects

While natural gas exports from Russia have been conducted exclusively by Gazprom in the past, revisions to the foreign trade and gas export laws entered into force to stipulate conditions to grant other companies an export license in December 2013, effectively ending Gazprom's monopoly of LNG exports. Industry's attention has been attracted on Rosneft's and Novatek's activities to develop respective LNG export projects targeting mainly the Asian markets, as well as Gazprom's own LNG projects.

Both Rosneft and Novatek have advanced their engineering and marketing activities to fulfil their LNG ambitions, in parallel with lobbying toward LNG export liberalisation.

Rosneft is working with ExxonMobil to establish an LNG export project based on the Sakhalin-1 gas. Rosneft signed two separate Heads of Agreements (HoAs) on LNG sales with Japan's Marubeni and Sodeco (Sakhalin Oil and Gas Development Company) in June 2013, followed by awards of two separate FEED (front-end engineering and design) contracts to Foster Wheeler and CB&I in September. Rosneft eyes a final investment decision (FID) in 2015 and first exports in 2018.

Novatek is advancing its Yamal LNG project on the arctic peninsula. The company agreed with China National Petroleum Corporation (CNPC) to hand over a 20% stake of the

project to the latter in September 2013, followed by signing of an HOA to supply 3 million tonnes per year of LNG to the latter in October. Novatek also signed an LNG sale and purchase agreement (SPA) with Gas Natural Fenosa (GNF) for 2.5 million tonnes per year in October. India's Petronet LNG, ONGC, and Indian Oil Corporation (IOC) are also reported to be in negotiations with Novatek on possible participation in the project. Novatek and Total, who had 80% and 20% of the project respectively as of December 2013, made a final investment decision (FID) in that month based on the above-mentioned sales agreements with CNPC and GNF, as well as their own marketing commitment. The partners hope to start LNG shipment in 2017.

After reducing its share to 60% with CNPC's formal participation in January 2014, Novatek may sell another 9% to other strategic partners.

Gazprom is working on its Vladivostok LNG project. The company signed an HoA with five Japanese companies on construction of the liquefaction plant in June 2013. The company also started natural gas production in the Kirinskoye field within the Sakhalin 3 license in October, which is expected to be an early feedgas source to the Vladivostok LNG plant.

With expected difficulty in increasing Russian pipeline gas sales to Europe, competition to market LNG in Asia between the three Russian companies is expected to be more intense.

5. Japan's record high payment for LNG imports

Although Japan's LNG imports only marginally grew in the calendar year 2013, its corresponding payment surpassed JPY 7 trillion, more than doubling that of 2010. The unit price climbed further in January 2014 to JPY 90,048 / tonne, compared to an average of JPY 49,592 in 2010.

As they are described as "Asian Premium", Asian LNG prices are more expensive than those in other parts of the world. As one culprit is identified as the region's linkage of LNG prices to those of oil, Asian LNG buyers initiated moves to reduce or eliminate the linkage in 2013. However, some sellers maintain their arguments to keep the linkage. The gap between the ideas still looks to be huge.

6. Changing patterns of short-term procurement of LNG

Japan's LNG demand increased significantly after the East Japan Great Earthquake and ensuing Fukushima Daiichi Nuclear Accident in March 2011 mainly to replace lost nuclear power. A large number of spot LNG cargoes were sold to Japan from those sellers in the Middle East and Atlantic who were in difficulty in finding outlets because of decreasing

demand in Europe and those European buyers who were in difficulty in offtaking their contracted purchases in full. As Japan's spot LNG imports increased steadily in the year, spot LNG prices also climbed. However, in 2012 a shift to short- to medium-term contracts from spot cargo purchases was observed, promoted by higher spot prices and anticipated difficulty to quick resumption of nuclear power operation. The nation's spot LNG procurement decreased throughout the year after hitting its peak in February. Japan's spot LNG purchases were less active in 2013, compared to those in the previous two years.

On the other hand Latin American importers have increased spot LNG purchases recently. Notably between January and March 2013, Brazil and Argentina scooped out excess cargoes in the Atlantic region due to increasing gas demand in the countries. Mexico's public power company CFE and state-owned oil company Pemex jointly bought 17 cargoes for 2013 and 12 for 2014 through a tender around the middle of 2013. The first commercial cargo from Angola LNG was exported to Brazil in July. Argentina awarded 98 cargoes for 2014 and 2015 through a tender process in October 2013. Additional cargoes for 2014 were procured by Enarsa in November 2013.

7. Stagnant growth of global trades of LNG in 2013

The global LNG trades did not grow much again in 2013⁴. Although Asian and Latin American importers increased LNG purchases, decreasing gas demand in Europe and reduction of exports in some producing countries meant the flat growth.

8. Troubles and inaugurations of LNG export projects in the Atlantic basin

Due to surging gas demand in the domestic market, lagging development of domestic supply sources and consequently decreasing domestic gas production, two LNG export facilities have not received sufficient feedgas lately, with no LNG production at the Damietta plant since December 2012 and a 50% utilization rate at the Idku plant. In the wake of this gas shortage in Egypt, Qatar provided Egypt with five LNG cargoes between July and September, which Egyptian LNG offtakers BG and GDF Suez delivered to their respective outlets. In the meantime the state-owned Egas is considering direct LNG imports on the Red Sea side.

Nigeria LNG declared force majeure on LNG exports and suffered force majeure from feedgas suppliers several times in 2013. Feedgas pipelines halted three times in 2013 because of sabotages and repair works - from the beginning of February to the middle of

⁴ 236.9 million tons imported or an increase of 0.3% vs.2012, " The LNG Industry in 2013" GIIGNL, April 2014

April, from the middle of May to the beginning of June, and from the end of September to the beginning of October - resulting in reduction of LNG export plant operation by 20% - 25%. Combined with the sluggish overall gas demand in Europe, the poor performance at the plant lead to a 40% reduction of Nigerian LNG delivery to Europe. A tax dispute between the export project and Nigeria's maritime authority provoked another declaration of force majeure on LNG exports from late June to late July.

Norway's Snøhvit export plant delayed resumption of LNG production from the end of February to the end of April due to mechanical troubles after a planned maintenance shutdown at the end of January, followed by another halt of production for two weeks from the end of May caused by different troubles.

During 2013 in the Atlantic region, Algeria's Skikda new train in March and Angola LNG in June started operation.

9. Increasing presence of East Africa as a potential major source of LNG

Three-way FEED (front-end engineering and design) works were kicked off at the beginning of 2013 by three separate engineering consortia on an LNG liquefaction plant sponsored jointly by two developing consortia of two offshore blocks that are expected to supply feedgas to the plant in Mozambique in East Africa, which is expected to be a next LNG supply source around the end of the decade. The sponsors target initial production capacity of 10 million tonnes per year, expandable to 50 million tonnes eventually.

In Tanzania, BG and Statoil, along with their respective partners, have made several gas discoveries in the deep water blocks in the South. They plan to develop LNG export projects with combined capacity of 20 million tonnes per year or so.

Asian importers are interested in the East African schemes as they are located relatively close to those potential supply sources. Thailand's PTT, a joint venture between ONGC and OIL of India, and ONGC by itself farmed in to the Block 1 offshore Mozambique in August 2012, June and August 2013 respectively, while China's CNPC indirectly acquired a stake in the Block 4 in March 2013. In the meantime Singapore's Pavillion Energy purchased a stake in the Blocks 1, 3 and 4 offshore Tanzania in November 2013. While both Mozambique and Tanzania boast huge potential of development in terms of resources, they also face challenges to overcome including undeveloped infrastructure, labour forces, and legal frameworks.

10. New LNG terminals and imports in China, Singapore, Malaysia, India, Israel and Indonesia, as well as plans in the Philippines and Myanmar

Southeast Asia's four major gas markets have all started receiving LNG, with terminals starting imports in Singapore in March and in Malaysia in April 2013, following those in Thailand and Indonesia. As Malaysia and Indonesia are still major LNG exporters in the world, more dynamic flows of cargoes are expected in the future, depending on market balances.

China and India also started operation at several LNG import terminals in 2013. The China National Offshore Oil Corporation (CNOOC) inaugurated two terminals and PetroChina started one in late 2013. One of CNOOC's at the Tianjin port is the country's first floating storage and regasification unit (FSRU). Gail's Dabhol terminal, Shell's expansion capacity at the Hazira terminal, and Petronet LNG's Kochi terminal started operation in January, May and August 2013, respectively, in India where domestic gas production offshore East Coast has been disappointing.

While Israel has potential to export LNG from the East Mediterranean offshore gas discoveries, the country started importing LNG in January 2013 through an FSRU.

Further additions of LNG receiving terminals are expected in Asia to increase intake in the future.

11. Expectations and reality of shale gas development in China and Europe

After the world map of energy has been redrawn by shale gas production in the United States, various developments have been observed in different countries with regard to development of shale gas in respective countries.

The Chinese government announced a shale gas development plan in March 2012 and has already introduced a subsidy program to encourage shale gas production. There have been some positive developments including Sinopec's announcement in October 2013 of 550 thousand cubic meter per day production in Chongqing and ensuing 50 commercial well drilling plan in 2014. However, as shale gas production in 2013 only stood at 200 million cubic meters according to preliminary figures from the Ministry of Land and Resources (MLR)⁵, the goal of 6.5 bcm production in 2015 stated in the above-mentioned development plan still looks difficult to achieve.

Different attitudes have been embraced by different countries in Europe in terms of

⁵ 「2013年油气勘探开发形势情况通报」、2014-01-08 中华人民共和国国土资源部、http://www.mlr.gov.cn/wszb/2014/2012vqcl/zhibozhaiyao/201401/t20140108_1300335.htm

shale gas development. The United Kingdom which has experienced reduction in domestic gas production and turned into a net gas importer, Poland who wants to reduce dependence on Russian gas, and Spain who wants to improve its fiscal imbalance are more positive on their own shale gas development. On the other hand France is reluctant on shale gas development, as the president reiterated his policy not to remove ban on hydraulic-fracturing in July 2013.

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