

LNG Review February 2018
- Recent issues and events -
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Introduction

On the back of soaring gas demand from Asia, especially in the harsh winter in recent months, which has sucked up expected LNG supply surplus, some experts and companies expressed concerns over potential supply deficits in the 2020s and expectations on investment decisions on LNG production projects.

Asian LNG spot prices were traded at over USD 10 in the first half of February for delivery in March and eased in the low 8s in the latter half of February as delivery windows shifted to April. China's imports of LNG hit another record level in January 2018, amounting to 5.18 million tonnes, compared with the previous record of 5.03 million tonnes set in December 2017 and up 51.2% from January 2017.

Initiatives were observed in February to set up additional LNG receiving capacity in Japan, in China and in other Asian countries, as well as Eastern Australia. On the other hand, there were also activities to add liquefaction capacity around the world to match. Some are inching toward investment decisions, and others are coming closer to production. A second LNG production project on the mainland of the United States shipped its first cargo at the beginning of March 2018.

Several major energy companies released their long-term energy and/or natural gas (LNG) outlooks, highlighting still strong expectations on important roles of natural gas and LNG in the increasing trend toward a decarbonizing world.

This paper looks at some important issues in the LNG industry in February 2018.

[Asia Pacific]

Japan's LNG imports in January 2018 were 8.263 million tonnes, the third highest in the history, shy of the previous monthly highs of 8.434 million tonnes and 8.302 million tonnes in January 2015 and 2017, respectively. The average price was the highest in two years at USD 8.64 / million Btu.

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There have been initiatives to set up additional LNG capacity, and more efficiently utilise existing facilities in Japan. Tokyo Gas Engineering Solutions (TGES), Shikoku Electric Power, Sumitomo Chemical, Sumitomo Joint Electric Power and Shikoku Gas decided to build an LNG terminal inside Sumitomo Chemical's plant in Ehime to supply gas to a planned power station and other customers in surrounding areas. Japan's JXTG Nippon Oil & Energy Corporation and Hokkaido Gas agreed to jointly utilise JXTG's Kushiro LNG terminal in Hokkaido from April 2018. The firms set up a joint-venture terminal operating company. Saibu Gas may add capability at its Hibiki terminal to reexport LNG.

S&P Global Platts says LNG swaps volumes, settled against its Japan Korea Marker (JKM) LNG price assessments, quadrupled in 2017 to 50,266 lots, equivalent to around 170 cargoes.

Fluor commenced FEED work for Electricity Generating Authority of Thailand's (EGAT) planned FSRU and associated facilities in the upper Gulf of Thailand. The FEED is expected to be completed by the middle of 2018. Total may make final investment decisions (FIDs) on LNG import projects in Myanmar - including a floating storage and regasification unit (FSRU) and gas-fired power plants - and Côte d'Ivoire in 2018.

According to Australia-listed Energy World Corporation (EWC), its LNG receiving terminal in the Philippines is 90%-completed on Pagbilao Island in Quezon province, some 90 km southeast of Manila. The terminal is expected to be supplied with LNG from the company's Sengkang LNG plant in Indonesia. The company expects to start up a gas-fired power plant by the end of 2018, fed by the LNG terminal. The company is also in discussions with local officials for an LNG plant to be built in Sulu province, in southern Mindanao island.

China's Sinopec received a commissioning cargo and the first commercial cargo of LNG from Australia delivered to its Tianjin LNG terminal in February 2018. Construction of ENN's Zhoushan terminal in Zhejiang region is more than 90% complete, with commissioning expected in the middle of 2018, said ENN.

An LNG import terminal at Mundra in Gujarat state on the west coast of India, partly owned by the Adani Group, maybe operational in April or May 2018. Construction on the terminal is completed, but Adani is unable to commission operations due to issues of a pipeline.

Santos and GLNG partners will make a capital investment of AUD 900 million in upstream developments in the Maranoa, Western Downs, Central Highlands and Banana regions in 2018. As well as upstream developments around the Fairview, Scotia and Arcadia fields, this investment includes the first year of funding for the new AUD 750 million Roma East project which will be developed over the next three years.

Marubeni, JERA, and Squadron Energy, a subsidiary of Australia's Munderoo Group,

signed a Memorandum of Understanding (MOU) to conduct a feasibility study on an LNG import terminal and gas supply project in New South Wales, Australia, which will include chartering a Floating Storage and Regasification Unit (FSRU). In the meantime, AGL Energy says its Crib Point LNG import jetty is progressing through key milestones for final investment decision (FID) in the fiscal year 2018-2019.

The Australian competition regulator ACCC said it would allow Chevron, INPEX, Shell, and Woodside Petroleum to coordinate maintenance activities at their LNG facilities in Western Australia and the Northern Territory.

Chevron said the Gorgon and Wheatstone LNG assets in Australia are becoming strong cash generators, with cash margins of more than USD 30 per barrel at USD 50 Brent price. The company said that four trains are online and running well.

The North West Shelf (NWS) venture is in arbitration with Korea Gas Corporation (Kogas) over an expired LNG contract, Woodside Petroleum said. Dispute is over the prices at "low slopes."

Woodside Petroleum is set to raise AUD 2.5 billion (USD 1.96 billion) to fund the purchase of ExxonMobil's 50% stake in the Scarborough gas field and to support projects in Australia and West Africa. Woodside will have a 75% stake and take over the Scarborough project. The company could accelerate development of Scarborough to feed an expansion of its Pluto LNG plant. Woodside Petroleum may offer its Pluto LNG partners Tokyo Gas and Kansai Electric Power stakes in the Scarborough gas field. Tokyo Gas and Kansai Electric each own 5% stakes in Pluto LNG. The company also said it was pushing out a final investment decision (FID) on the Browse LNG project to 2021.

Mitsui & Co. entered into a takeover bid implementation deed (BID) with AWE Limited (AWE), under which Mitsui has agreed to make a recommended takeover offer of AUD 0.95 cash per share for all of the issued shares of AWE.

Timor Leste and Australia have reached an agreement for a treaty on their maritime border, the Permanent Court of Arbitration said, paving a way to develop the Sunrise offshore gas fields. The agreement would establish a maritime boundary in the Timor Sea for the first time.

Malaysia's Petronas signed its first term agreement to supply LNG in India. Petronas is to supply LNG to H-Energy Mideast DMCC (HEMD).

According to Australia-listed Energy World Corporation (EWC), construction of its Sengkang LNG plant in Indonesia is 80%-completed. Its design capacity is 2 million tonnes per year with four modular trains progressively installed with three-month intervals.

ExxonMobil, Total and their partners in Papua New Guinea broadly agreed on how they want to expand the PNG LNG project using gas from new and existing fields, Oil Search

said. They set to propose three new LNG trains with total capacity of 8 million tonnes per year, with two trains for Total-controlled Papua LNG fed from the Elk-Antelope fields and another to be underpinned by gas from existing PNG LNG fields and P'nyang field. A decision on front-end engineering and design (FEED) is expected in the second-half of 2018. Separately, Oil Search is looking to build small-scale LNG export plants in the country.

After the 7.5 magnitude earthquake in the Highlands on Monday 26 February 2018, the two LNG trains at the PNG LNG plant were safely shut down following shut down of the Hides Gas Conditioning Plant and well pads. As of the end of the month, there was no indication of damages on the 700 km pipeline that delivers gas to the LNG plant.

[North America]

According to the Energy Information Administration (EIA), in December 2017, for the seventh consecutive month, dry natural gas production increased year-to-year from the same month a year ago. The preliminary level for dry natural gas production was 2,427 billion cubic feet (Bcf), or 78.3 Bcf/day. The average daily rate of dry natural gas production was the highest for any month. Based on the monthly data, the yearly dry natural gas production in 2017 was 26.9 tcf (559 million tonnes), compared to 26.7 tcf in 2016 and 27.1 tcf in 2015. The yearly estimated natural gas consumption was 27.1 tcf, compared to 27.5 tcf in 2016. Based on the monthly data from the Department of Energy (DOE), the United States exported 14.7 million tonnes of LNG in 2017, compared to 3.82 million tonnes in 2016. 1.59 million tonnes was imported in 2017. EIA forecasts that natural gas production will reach 80.3 Bcf/d (829 bcm = 610 million tonnes) in 2018, establishing a new record.

Several cases in EIA's Annual Energy Outlook 2018 (AEO2018) show how projected generation and capacity could continue to be affected by fuel price patterns, particularly for the price of natural gas. In a sensitivity case with low natural gas prices, natural gas ultimately provides more than half of electricity generation by the mid-2040s. In the Reference case, natural gas remains the leading source of electricity generation through 2050. By 2050, natural gas accounts for 35% of total electricity generation, a slight increase from its 2017 share of 31%.

Cheniere Energy entered into two LNG sale and purchase agreements (SPA) with China National Petroleum Corporation (CNPC). Under the SPAs with Cheniere subsidiaries Corpus Christi Liquefaction and Cheniere Marketing International, PetroChina International Company will purchase 1.2 million tonnes per year of LNG, with a portion of the supply beginning in 2018 and the balance beginning in 2023.

On 8 February 2018, the United States Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) issued a Corrective Action Order

(CAO) to Sabine Pass Liquefaction, LLC to shut two LNG storage tanks, after discovery of a release of LNG from a Sabine Pass storage tank on 22 January 2018. Cheniere Energy said LNG production will not be affected following the order.

Höegh LNG announces that the FSRU Höegh Giant commenced its time charter contract with Gas Natural Fenosa. The initial term of the contract is three years, and it includes the option for Gas Natural Fenosa to utilize the unit as an FSRU. Until FSRU employment is established, the unit will trade in Gas Natural Fenosa's fleet.

A ship carrying the first cargo of LNG departed on Thursday 1 March 2018, from the Dominion Energy Cove Point LNG terminal. Shell NA LNG is providing the natural gas needed for liquefaction during the commissioning process and is off-taking the LNG that is produced.

Texas LNG Brownsville announced that the United States Coast Guard (USCG) has issued a Letter of Recommendation to the Federal Energy Regulatory Commission (FERC) confirming the suitability of the Brownsville Ship Channel for Texas LNG's marine traffic.

Andeavor acquired the Kenai LNG facility from ConocoPhillips for its petroleum refinery.

LNG Canada shortlisted two out of its four potential engineering, procurement and construction (EPC) contractors for the proposed LNG plant in Kitimat, British Columbia. The finalists are the partnership of TechnipFMC and KBR (LNG BC Contractors), and the partnership of JGC and Fluor.

Pieridae Energy Limited engaged Morgan Stanley and Société Générale to serve as financial advisors for Pieridae Energy's Goldboro LNG project.

Mexico became the International Energy Agency's (IEA) 30th member country on 17 February 2018, and its first member in Latin America.

[Middle East]

Qatar Petroleum (QP) has rolled out its new Corporate Strategy and core values. The rollout signals a new era of growth for QP, led by the planned expansion of North Field production, which will raise its LNG production from 77 million to 100 million tonnes per year.

Iran needs over USD 40 billion in investment to prevent natural gas pressure from dipping in the South Pars Gas Field in the Persian Gulf by 2023, Oil Minister said. The minister also said Iran cancelled its first FLNG deal with Hemla, which the National Iranian Oil Company (NIOC) signed in October 2017.

The partners in Israel's Tamar and Leviathan fields, including Noble Energy and Delek Group, signed deals with Egypt's Dolphinus Holdings to export natural gas to Egypt

over 10 years. One accord calls for the sale of 3.5 bcm per year from the Leviathan field, for a total of 32 bcm with an additional accord for the sale from the Tamar field for a total of 32 bcm. Possible transport options include the Jordanian-Israeli pipeline that is currently being built, the existing East Mediterranean Gas pipeline, and another option to connect the Israeli and Egyptian transmission systems.

[Africa]

BP announced the start of gas production from the Atoll Phase One project in the North Damietta concession in the East Nile Delta offshore Egypt. The project is producing 350 million cubic feet of gas a day and 10,000 barrels a day (bpd) of condensate.

An Inter-Government Cooperation Agreement (ICA) signed on Friday 10 February 2018 between the governments of Mauritania and Senegal provides for development of the Tortue/Ahmeyim gas field through cross-border unitisation, with a 50%-50% initial split of resources and revenues and a mechanism for future equity redeterminations based on actual production and other technical data.

During the fourth quarter of 2017, Anadarko made progress with its Mozambique LNG project by beginning the resettlement process to prepare the onshore location for the future LNG park. In February 2018, Mozambique LNG1 Company entered into a long-term LNG Sale and Purchase Agreement (SPA) with Électricité de France (EDF) for 1.2 million tonnes per year for 15 years. The project will be Mozambique's first onshore LNG development, initially consisting of two LNG trains with total nameplate capacity of 12.88 million tonnes per year to support the development of the Golfinho/Atum fields located entirely within Offshore Area 1.

Total signed an agreement to sell a 25% interest in the Exploration Block 11B/12B, offshore South Africa, to Qatar Petroleum (QP). The Block 11B/12B is located in the Outeniqua Basin, around 175 kilometers off the southern coast of South Africa. The new partnership structure will be as follows: Total (operator, 45%), Qatar Petroleum (25%), CNR international (20%) and Main Street (10%).

[Europe / Russia]

Total Marine Fuels Global Solutions (TMFGS) and Mitsui O.S.K. Lines, Ltd. (MOL) signed a long-term charter contract for the largest LNG bunkering vessel of 18,600 m³, to be delivered in 2020 to operate in Northern Europe. The vessel will be built by Hudong-Zhonghua Shipbuilding in China and fitted with the Mark III membrane containment system provided by France's GTT.

The Dutch government aims to adopt a recommendation by the regulator to cut

production at the Groningen gas field by nearly half to 12 billion cubic meters per year as quickly as possible to limit the risk of earthquakes, the Economy Minister said.

GasLog said on the Alexandroupolis Project in Greece, with FSRU O&M agreement between GasLog and Gastrade nearing finalization, negotiations with DEPA and Bulgarian Energy Holding (BEH) regarding equity participation progressing, advanced capacity reservation agreement discussions with off-takers also progressing, start-up date is aligned to Interconnector Greece - Bulgaria (IGB) start date and the FID (final investment decision) is expected in late 2018.

Eni made a lean gas discovery in Block 6 Offshore Cyprus with Calypso 1 NFW, which confirms the extension of the "Zohr like" play in the Cyprus Exclusive Economic Zone (EEZ). Eni is the Operator of Block 6 with 50% of participation interest while Total is partner with the remaining 50%.

Croatia's plans for a floating LNG terminal on the Adriatic island of Krk is opposed by some environmentalists and residents, who have raised concerns about the impact on sea life and tourism and suggest the terminal be built on land instead. Croatia produces around a half of its gas consumption and the terminal would also supply regasified gas to central and eastern European countries.

Russia's natural gas production was at 65.35 billion cubic meters (bcm) in January 2018, up from 63.5 bcm in December 2017. Gazprom said that its production in January fell by 3.2% year on year to 45.6 bcm. Gazprom reported on Saturday 24 February 2018 the fourth consecutive day of a new record in daily gas exports to non-CIS countries (CIS). The latest record high was 655.2 million cubic meters. In 2017 Gazprom increased gas production from 2016 by 12.4% to 472 bcm and gas exports to Europe by 8.1% 193.6 bcm.

Gazprom plans to reorganise its export operations to create an integrated international distribution unit responsible for all of its exports. The reorganisation would take place in two stages over two years. The first stage would involve merging and streamlining the assets and activities of Gazprom Germany, which handles a large proportion of the group's exports. The second stage would see Gazprom Germany operationally merged with Gazprom Export.

Gazprom makes systematic efforts to increase energy efficiency in gas transmission by, improving metering systems and using advanced techniques for leak detection. Natural gas losses in the UGSS (Unified Gas Supply System) went down by 2.4 times between 2009 and 2017.

Russia's Gazprom decided not to restart supplies to Ukraine, forcing Ukraine's Naftogaz to ask heating firms to use less gas in early days in March 2018. It follows the international arbitration court order on Wednesday 28 February for Gazprom to pay USD

2.56 billion to Naftogaz.

[South America]

The number of LNG tankers traversing the Panama Canal is expected to jump 50% by September 2018 due to rising exports from the United States, the canal authority ACP said.

Peru's LNG exports halted three weeks after landslides and heavy rains in southeast Peru ruptured a natural gas pipeline operated by Transportadora de Gas de Peru SA in early February 2018.

[Global issues]

The global LNG market grew by 29 million tonnes to 293 million tonnes in 2017, according to Shell's annual LNG Outlook. Based on current demand projections, Shell sees potential for a supply shortage developing in mid-2020s, unless new LNG production project commitments are made soon.

The average LNG contract length for deals signed in 2017 fell to 6.7 years, compared with 11.5 years in 2016, according to Poten & Partners.

ExxonMobil released its Energy & Carbon Summary: Positioning for a Lower-Carbon Future and its Outlook for Energy: A View to 2040. Based on the average growth rates of assessed 2 degree Celsius (2oC) scenarios, natural gas demand is estimated to increase to 445 billion cubic feet per day by 2040; oil demand is estimated to decline to 78 million barrels per day by 2040.

According to BP's Energy Outlook 2018, the global energy mix is the most diverse the world has ever seen by 2040, with oil, gas, coal and non-fossil fuels each contributing around a quarter. Natural gas demand grows strongly and overtakes coal as the second largest source of energy. By 2040, the United States accounts for almost one quarter of global gas production, and global LNG supplies will more than double.

Reference: Company announcements, Reuters, Bloomberg, AP, 新华网, Natural Gas Monthly by the Energy Information Administration of the United States, Financial Tribune Iran, Trend News Agency, The Times of Israel, Hydrocarbon Engineering, Cedigaz News Report.

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