

LNG Review October 2019
- Recent issues and events -
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Introduction

The combined LNG imports into the four big markets in Northeast Asia during the first nine months of 2019 amounted to 143 million tonnes, a 1% decrease year-on-year. Japan and Korea both decreased LNG imports by 8% each and Chinese Taipei decreased LNG import by 4%, largely offsetting an 18% or 6.6 million tonne increase in China in the same period. As the total LNG trade in the world increased by 12% from one year earlier approaching 260 million tonnes during the first three quarters in 2019, the share of the Northeast Asia big four declined to 55% in the period, from 62% in the twelve months of 2018. On the other hand, the European region, including Turkey, imported more than 60 million tonnes of LNG during the nine-month period in 2019.

During the same period, Australia and the United States increased LNG exports by more than eight million tonnes each, while Russia also increased its by seven million tonnes. Australia came closer to the top LNG exporter spot after Qatar, while both the United States and Russia increased their LNG exports by more than 50%, respectively. Both Egypt and Algeria, where domestic gas production steadily increases, increased their respective LNG exports significantly during the period.

Assessed spot LNG prices remain in the lowest levels in the past ten years, reflecting ample LNG supply capacity and modest growth of demand. Those prices for December 2019 delivery, rising above USD 7 per million Btu briefly in the middle of October, went down to below USD 6 by the end of the month.

No final investment decision on LNG production facilities was announced during the month of October.

[Asia Pacific]

According to Japan's customs statistics, Japan imported 6.44 million tonnes of LNG in September 2019, which entails the average price of USD 9.6 per million BTU. The average price of LNG imported from the United States into Japan in the month was nearly USD 2

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lower than the overall average. By contrast, average spot LNG prices - both the one published by METI (Ministry of Economy, Trade and Industry) and the ones assessed by price reporting agencies - for September delivery were in the USD 4s. Japan's LNG import during the first nine months of 2019 amounted to 57.95 million tonnes, a 7.6% decrease from a year earlier and the lowest for the same period since 2010.

Kyushu Electric Power reported its ordinary income decreased during the second quarter of Fiscal Year 2019 (July - September) compared to FY2018 2Q, due to several reasons, including losses in surplus LNG trading due to decline of the market price.

Thailand's Energy Minister said that the government will support PTT's gas business at the regional level and that the Energy Regulatory Commission (ERC) will ease related regulations for LNG import and re-export. The company's new business plan includes providing fully integrated services such as small-scale distribution, gas pipeline development, energy solutions, power backup and renewable energy. The company's second LNG terminal is being constructed in Nong Fab with a capacity of 7.5 million tonnes and is expected to begin operations in 2021.

JERA entered into a Memorandum of Understanding (MOU) with Vietnam Electricity (EVN) concerning cooperation in the LNG value chain business. JERA and EVN will discuss opportunities for mutual collaboration in the LNG value chain business, including joint procurement of LNG, joint development of LNG receiving terminal projects, cooperation in introducing LNG to EVN power plants and collaboration on LNG shipping.

According to figures from NDRC (National Development and Reform Commission), China's natural gas production, import, and consumption all grew by about 10% year-on-year during the first nine months of 2019. Among the gas import, LNG increased by 18% to 44 million tonnes, while pipeline import was almost the same from the period one year ago.

China's Yantai LNG Group is aiming to start up an LNG import terminal in Shandong by 2022, sources said. Yantai LNG Group is majority owned by Poly-GCL Petroleum Group. China National Offshore Oil Corporation (CNOOC) is working with a railway company to two-year trial delivery of LNG by rail, a senior company executive said.

China Suntien Green Energy received approval for the Tangshan LNG Project of Caofeidian Suntien Natural Gas by NDRC. The total planned capacity of the project is 12 million tonnes per year, in which 10 million tonnes are planned from the first two berths; another berth is planned to be constructed jointly with a third-party company.

Indian Oil Corporation (IOC) expects its five million tonne per year LNG import terminal at Ennore to be fully operational by December 2020. It currently supplies gas to a refinery, a fertilizer and a petroproduct plants. ExxonMobil signed a preliminary agreement with IOC to explore new models of delivering cost-effective natural gas. Meanwhile,

ExxonMobil will offer its expertise to India's Oil and Natural Gas Corporation (ONGC) to help develop resources in offshore blocks, according to sources.

Sources said that the Mundra LNG terminal could be commissioned in December 2019 as a dispute between Gujarat State Petroleum Corporation (GSPC) and Adani Group could be resolved. The terminal was inaugurated by India's prime minister in October 2018. But the commissioning was stalled with disputes between GSPC and Adani.

Total expands its partnership with the Adani Group. The partnership between Adani (50%) and Total (50%) includes several assets across the gas value chain including two LNG terminals: Dhamra in East India and potentially Mundra in the West, as well as Adani Gas Limited, one of the 4 main distributors of city gas in India of which Adani holds 74.8% and of which Total will acquire 37.4%. As part of this partnership, Total will bring its LNG and retail expertise and will supply LNG to Adani Gas Limited. Total and Adani will also establish a joint venture to market LNG in India and Bangladesh.

Pakistan LNG cancelled a tender to buy LNG over a 10-year period and may turn to the spot market instead, sources said. The company issued the tender in early June 2019 to import 240 LNG cargoes over 10 years for the country's second LNG terminal. Universal Gas Distribution Company (UGDC) said that the first private LNG cargo will arrive at the Gasport Terminal in Pakistan. The company said it will provide regasified LNG to CNG stations.

Saudi Aramco and ACWA Power signed a deal with Bangladesh to develop a 3.6 GW LNG-based power plant and terminal in either the Moheshkhali area or the port of Payra.

Australian Industrial Energy (AIE) submitted a modification plan to its existing Development Consent (Consent) for its Port Kembla Gas Terminal in order to meet higher demand for natural gas during peak periods. AIE's customers have expressed that their gas demands during peak season (typically between April and September) exceed the volume approved in the current Consent granted by the NSW Department of Planning. The request seeks to increase the number of annual LNG cargoes received at the terminal from 26 shipments of standard-sized vessels (170,000 m³) to up to 46 shipments of variable sized vessels. The Project's FSRU (floating storage and regasification unit) will not need to be modified as it has the capacity to handle the extra throughput. AIE will be required to undertake additional environmental and hazard studies which will then be assessed by NSW Government agencies.

According to Woodside's Q3 2019 report, the Browse Joint Venture is aligned on being ready to commence FEED by the end of 2019. Negotiation of the gas processing agreement is continuing. Woodside is targeting FID in H1 2021. The targeted RFSU dates of 2026 and 2027 remain unchanged.

ConocoPhillips entered into an agreement to sell the subsidiaries that hold its

Australia-West assets and operations to Santos. The subsidiaries hold the company's 37.5% interest in the Barossa project and Caldita Field, its 56.9% interest in the Darwin LNG facility and Bayu-Undan Field, its 40% interest in the Poseidon Field, and its 50% interest in the Athena Field. ConocoPhillips will retain its 37.5% interest in the Australia Pacific LNG (APLNG) project and operatorship of that project's LNG facility. Acquisition advances and supports Santos' goal of taking Barossa FID by early 2020. Santos is prepared to sell down equity in Barossa and Darwin LNG to a target ownership of 40% - 50% to achieve increased partner alignment. Barossa partner SK E&S has signed a Letter of Intent (LOI) to acquire a 25% interest in Bayu-Undan and Darwin LNG. Santos is also in discussions with existing Darwin LNG joint-venture partners for equity in Barossa and in discussions with LNG buyers for Barossa offtake volumes, including with an existing partner in Darwin LNG.

INPEX and Shell signed the Masela Block Production Sharing Contract (PSC) amendment including 7-year additional time allocation and 20-year extension for the Abadi LNG Project, with SKK Migas.

[North America]

Based on information distributed by the Department of Energy (DOE), the Lower 48 of the United States exported 2.88 million tonnes of LNG during August 2019, of which 0.44 million tonnes was shipped to Japan, making Japan the top destination for the fourth time after January 2019, November 2018 and December 2016. During the first eight months of 2019, LNG export amounted to 22.24 million tonnes, a 57% increase from the same period in 2018. The authority has stopped publishing prices of individual shipments since its July data, but only indicating weighted averages of prices from the same export sources, responding to concern from players that showing individual cargo prices may lead to competitive disadvantages.

Working natural gas inventories in the Lower 48 states totaled 3,519 billion cubic feet (Bcf) for the week ending on 11 October 2019, according to the U.S. Energy Information Administration's (EIA). That reporting period was the first week that Lower 48 states' inventories exceeded the previous five-year average since 22 September 2017.

Dominion Energy entered into an agreement with Brookfield Asset Management. Dominion will transfer a 25% equity interest in Cove Point to Brookfield. The transaction close is expected by the end of 2019.

Tohoku Electric Power signed an LNG long-term sales and purchase agreement with Diamond Gas International (DGI) to purchase 0.2 million tonnes per year of LNG from the Cameron LNG project in the United States for 18 years from 2022.

Sempra Energy entered into a memorandum of understanding (MOU) with Mitsui &

Co. reflecting the parties' preliminary agreement for Mitsui's participation in the Cameron LNG Phase 2 project in Louisiana, and a future expansion of the Energía Costa Azul (ECA) LNG project in Baja California, Mexico. The MOU is non-binding and contemplates the continued mutual support for the development of Cameron LNG Phase 2, including Mitsui's purchase of up to one-third of the available capacity of the project, as well as the potential offtake of approximately 1 million tonnes per year of LNG and equity participation in a future expansion of ECA LNG. In November 2018, Sempra LNG and Mitsui entered into a heads of agreement (HOA) and are currently working to negotiate and finalize a definitive 20-year LNG sales-and-purchase agreement for the potential purchase of 0.8 million tonnes per year of LNG from the ECA LNG Phase 1 project.

Golden Pass LNG Terminal LLC told FERC (Federal Energy Regulatory Commission) that it expects to place Train 1 in service "no later than September 2025"; Train 2 by March 2026; and Train 3 by November 2026. FERC approved construction of the project in late 2016, setting a December 2021, deadline to place the project into service.

NextDecade and Mubadala Investment Company, the Abu Dhabi-based sovereign investor, reached agreement for Mubadala to purchase USD 50 million of NextDecade's common stock in a private placement. NextDecade expects to make a final investment decision on its Rio Grande LNG project in the first quarter of 2020.

DOE issued an order to Venture Global Plaquemines LNG approving exports of domestically produced LNG. Plaquemines LNG will have authority to export up to 3.4 billion cubic feet per day (Bcf/d) of natural gas as LNG (25.82 million tonnes per year) to any country with which the United States does not have a free trade agreement (FTA) and with which trade is not prohibited. FERC authorized Plaquemines LNG to construct and operate the project in September 2019. DOE has approved 38.06 Bcf/d of exports in the form of LNG and compressed natural gas to non-FTA countries. Of this approved amount, approximately 15 Bcf/d (114 million tonnes per year) of export capacity is in various stages of operation and construction across eight large-scale export projects.

Texas LNG Brownsville filed a request with FERC to quickly issue final approval to construct and operate the proposed LNG plant. FERC issued the final Environmental Impact Statement (EIS) for the project in April and FERC approval had been expected in June 2019. The U.S. Fish & Wildlife Service (FWS) issued its final biological opinion for the Annova LNG project in Brownsville, Texas, saying that the construction of the project will not likely jeopardize the existence of "the ocelot or Gulf Coast jaguarundi."

FERC released the schedule for its environmental review of the proposed Commonwealth LNG facility and an associated natural gas pipeline in Cameron Parish, Louisiana. A draft environmental impact statement (EIS) is expected to be released in May

2020, and a final EIS is scheduled to be released on 2 October 2020. Other federal agencies' reviews of the project are to be completed by 31 December 2020. On the other hand, FERC has delayed completion of an EIS for Pembina Pipeline's Jordan Cove LNG export facility and Pacific Connector pipeline project in Oregon to 13 February 2020.

The U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA), in coordination with the Federal Railroad Administration (FRA), announced that it is publishing a notice of proposed rulemaking (NPRM) regarding the transportation of LNG. Currently, LNG may only be transported via rail in a portable tank with an approval from FRA. However, the Hazardous Materials Regulations (HMR) does authorize the DOT 113 specification tank car for other flammable cryogenic liquids. It is specifically designed for the transportation of refrigerated liquefied gases. This design specification may be similarly suitable for the transport of LNG.

Dubai-based Lloyds Energy subsidiary Qilak LNG plans to construct an LNG liquefaction facility of 4 million tonnes per year at Point Thomson, Alaska, and ship LNG to Asian markets on ice-breaking tankers. ExxonMobil agreed to produce and sell at least 0.56 bcf per day of natural gas from its Point Thomson field. The project plans to begin exporting LNG in the middle of 2020s. Qilak would not need the 800-mile (1,387 km) pipeline proposed for the Alaska LNG project.

Pieridae acquired all of Shell Canada's Alberta Foothills-area production and assets. The deal includes: three gas plants; just under 29,000 BOE/d of production; a 14% working interest in the Shantz sulphur forming plant, and 1,700 km of pipelines. Pieridae believes that the deal helps the company secure the majority of the gas needed to supply the first train at the Goldboro LNG project.

The British Columbia government, the Vancouver Fraser Port Authority and FortisBC study options for the first LNG ship-refuelling facility on North America's west coast.

Encana Corporation announced its intention to establish corporate domicile in the United States in 2020. The company will also rebrand under the name Ovintiv Inc.

[Middle East]

Accession to the Ghasha Concession Agreement with a 5% share was signed by LUKOIL and Abu Dhabi National Oil Company (ADNOC). Ghasha is a project for the development of previously undeveloped deposits of gas, oil and gas condensate as part of 9 shallow fields in the Arabian Gulf west of Abu Dhabi. The other partners in the Concession are ENI (25%), Wintershall Dea (10%) and OMV (5%). The project is expected to produce over 40 million cubic meters per day of natural gas and 120,000 barrels per day of crude oil and gas condensate.

[Africa]

Nigerian National Petroleum Corporation (NNPC) signed a USD 2.5 billion pre-payment agreement with Nigeria LNG (NLNG) for upstream gas development projects to supply trains 1-6.

Kosmos Energy announced that the Orca-1 exploration well made a major gas discovery offshore Mauritania in the BirAllah area. Orca-1 and Marsouin-1 have de-risked up to 50 TCF. Partners in the BirAllah gas hub, located offshore Mauritania, include SMHPM, BP, and Kosmos.

A consortium of JGC, Fluor and TechnipFMC (JFT) was awarded the engineering, procurement and construction (EPC) project by Area 4 operator Mozambique Rovuma Venture (MRV) for its onshore LNG production complex to be built in Cabo Delgado, Mozambique. The complex will consist of two natural gas liquefaction trains, with a total LNG nameplate capacity of 15.2 million tonnes per year as well as associated onshore facilities. LNG production is expected to commence in 2025.

[Europe / Russia]

According to a new OIES report, the LNG community needs to replace an 'advocacy' message - based on the generality of emissions from combustion of natural gas being lower than from other fossil fuels - with certified data on carbon and methane emissions from specific elements of the value chain for individual projects. LNG cargoes which do not have value chain emissions certified by accredited authorities, or which fail to meet defined emission levels, will run the risk of being deemed to have a lower commercial value and eventually being excluded from jurisdictions with the strictest standards.

Elengy offers an LNG tanker truck loading service at the Fos Cavaou LNG terminal, with two loading bays. The construction of the Fos Cavaou station was supported at 30% by European funding. The Fos Tonkin terminal also has two bays. Since September 2019, the Fos Cavaou terminal can also receive bunker-vessels at its berth. The bunker-vessels received at Fos Cavaou will offer LNG bunkering in the Port of Marseille-Fos and will also be able to deliver LNG to French and foreign Mediterranean ports.

Russia's Gazprom started filling the first leg of the offshore section of the TurkStream gas pipeline with gas. South Stream Transport B.V. noted that the first deliveries are scheduled for the end of 2019. TurkStream will have the capacity of 31.5 bcm per year. The project consists of two lines across the Black Sea, the first of which will serve Turkey with a capacity of 15.75 bcm, while the second line is planned to serve Europe. Each pipeline is 930 km in length, laid at depths reaching 2,200 meters. Of the two onshore lines, Turkey's BOTAŞ

is constructing the onshore line to connect to the Turkish grid and a BOTAŞ-Gazprom joint venture is building the second line toward Europe.

Gazprom is making preparations for the first pipeline supply of gas to China via the Power of Siberia gas pipeline. The gas from the Chayandinskoye field in Yakutia has reached the near-border gas metering station in the proximity of Blagoveshchensk. Production drilling is in full swing at the Irkutsk Region-based Kovyktinskoye field, which will start feeding gas into the pipeline in early 2023. The core equipment of the Amur Gas Processing Plant's (GPP) first two production trains is nearly assembled, with works underway on the third train. Expansion is being carried out at the Sakhalin - Khabarovsk - Vladivostok gas pipeline section between Komsomolsk-on-Amur and Khabarovsk.

[South America]

During the Panama Canal 2019 fiscal year, transits of LNG and LPG rose by 37.6% and 6.9% respectively, representing the largest gain across all segments.

The AES Corporation announced the start of operations of the first LNG hub in Panama and Central America, at the AES Colón plant. AES Colón consists of the 180,000 m³ LNG tank and a 381 MW combined cycle power plant, which reached commercial operations in 2018 and had been previously operating with gas from temporary sources. AES has reserved 80% of the terminal capacity for use by industrial and commercial companies in Panama and Central America.

Golar Power, a (50/50) joint venture between Golar LNG and Stonepeak Infrastructure Partners, was awarded a 25-year power purchase agreement (PPA) for the construction of a 605 MW combined cycle thermal power plant at a power auction in October by the Brazilian National Electric Energy Agency (ANEEL). The LNG-to-power Project will be developed by CELBA (Centrais Eletricas Barcarena S/A), a special purpose company 50% controlled by Golar Power. Golar Power anticipates accelerating investment in a new LNG Terminal in Barcarena, State of Pará. The terminal will be wholly operated by Golar Power and will provide an FSRU for 25 years. The Terminal is expected to commence operations by mid-2021 and to supply power plants, commercial and industrial customers, transportation and bunkering users well in advance of the power project commencement. FSRU selection and detailing of the terminal are under way with an anticipated FID in 1H 2020.

Reference: Company announcements, Reuters, Bangkok Post, Economics Times India, The Hindu Business Financial Express India, News International Pakistan, Alaska Public Media, Vancouver Sun, DAILY SABAH ISTANBUL, Cedigaz News Report.

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