

LNG Review November 2018 - Recent issues and events - Hiroshi Hashimoto*

Introduction

Following the international crude oil prices which began falling in early October, spot LNG prices in Northeast Asia slowly went down in November from the middle of USD 10s to the year-on-year lower levels in high USD 9s at the end of the month. On the other hand, the NYMEX Henry Hub future prices climbed from USD 3.2 to USD 4.6 during the month, affected by storage inventory levels significantly lower than the season's normal in recent years in the United States.

Several proposed LNG production projects made notable progresses during the month in North America, Africa and other regions, in terms of marketing and engineering activities as well as regulatory approval procedures, inching toward positive investment decisions possibly in early 2019.

This paper looks at some of important events and issues in the LNG industry in November 2018.

[Asia Pacific]

Tokyo Gas signed an MOU on cooperation in the LNG business with RWE Supply & Trading. Tokyo Gas also announced a plan to install a hydrogen refilling station in Toyosu where hydrogen derived from the company's city-gas supply will be supplied to fuel buses operated by the metropolitan public transportation authority.

According to preliminary information for November 2018 from the customs statistics, China imported another record-high 9.154 million tonnes of natural gas in the month. According to NDRC (National Development and Reform Commission), China produced, imported and consumed 13.4 bcm, 10.07 bcm and 23.17 bcm, respectively, of natural gas in October 2018, and 129.7 bcm, 98.7 bcm and 224.9 bcm in the first ten months of the year, increasing year-on-year by 6.4%, 36.7% and 20.6%, respectively.

Höegh LNG announced that *Höegh Esperanza* had arrived at the Tianjin LNG terminal in China and had started commissioning for FSRU operations, under an FSRU/LNGC time charter with CNOOC. The FSRU has both open and closed loop regasification capability, as well as full LNGC trading capabilities. CNOOC signed an

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agreement with Malaysia's Petronas for LNG supply starting in 2019.

Hong Kong utility CLP Power has received an environmental permit for the territory's first LNG receiving terminal from the Environmental Protection Department.

The India's PNGRB (Petroleum and Natural Gas Regulatory Board) is progressing City Gas Distribution (CGD) Projects in 129 Districts, followed by additional 124 districts.

The Competition Commission of Pakistan (CCP) completed a detailed study on the LNG sector. The assessment shows various barriers to competition at all levels of the LNG value chain. Recommendations include alternate pricing arrangements- the S-Curve Model, introduction of price ceiling and floor, introduction of spot market and natural gas hubs in the pricing model, and renegotiation of price review periods.

Nippon Export and Investment Insurance (NEXI) decided to underwrite Overseas Investment Insurance for an LNG receiving terminal project that uses an FSRU in Bangladesh to support Mitsubishi Corporation's investment.

Australia's Treasury Minister advised the consortium led by CK Group of his preliminary view that its proposed acquisition of APA Group would be contrary to the national interest.

Under infrastructure sharing arrangements between Australia Pacific LNG (APLNG) and QCLNG projects, the latter will be able to transport and process gas and water from the Arrow Energy Surat Basin fields using capacity in existing joint infrastructure. In addition, APLNG has secured up to 350 PJ of gas from QCLNG over 10 years from 2024.

The Australian Government released its final response to the review of the Petroleum Resource Rent Tax (PRRT). The changes will be introduced from July 2019.

Santos completed the acquisition of Quadrant Energy (Quadrant), which was announced in August 2018.

China's Zhenhua Oil purchased its first LNG cargo from Chevron, discharged at CNOOC's Yuedong terminal in Shenzhen, sourced from the Australian Gorgon project.

The North West Shelf Joint Venture signed non-binding preliminary agreements with the Browse Joint Venture and Chevron, the leaseholder of the Clio-Acme fields, for the processing of their respective gas resources through the NWS facilities on Burrup Peninsula. Gas from Clio-Acme is planned to be transported through the Pluto offshore infrastructure and then via the proposed Pluto-NWS Interconnector pipeline.

Woodside entered into a 20-year gas sale with Perdaman Chemicals and Fertilisers for 125 TJ per day (0.84 million tonnes per year) for use in Perdaman's proposed urea plant. Gas will be supplied from Woodside's portfolio and primarily sourced from Woodside's proposed Scarborough development, commencing between 2023 and 2025.

Shell Australia and the Government of Timor-Leste entered into a Sales and

Purchase Agreement (SPA) for the sale of Shell's 26.56% interest in the Greater Sunrise (Sunrise and Troubadour) fields.

Malaysia's Petronas supplied its first LNG cargo to the 7,500 m³ LNG bunker vessel Kairos at the Regasification Terminal Pengerang (RGTP) in southeast Johor. Petronas also completed its first commercial Gassing Up and Cooling Down (GUCD) services at the Bintulu LNG complex.

Energy World Corporation Limited (EWC) was granted a 20-year extension to the Production Sharing Contract (PSC) on the Sengkang gas field in South Sulawesi, Indonesia.

Total, ExxonMobil and Oil Search signed a Memorandum of Understanding (MoU) with the government of Papua New Guinea on the key terms of the Gas Agreement for the Papua LNG Project. The project will encompass two LNG trains of 2.7 million tonnes per year each.

[North America]

Working natural gas in storage in the Lower 48 states as of the end of October 2018 totaled 3,208 billion cubic feet (Bcf). Inventories were 598 Bcf (16%) lower than the five-year (2013 - 17) average, 569 Bcf (15%) lower than one year earlier, and the lowest end-of-refill season level for working gas stocks since 2005, and inventory levels in all regions were lower than their five-year minimums.

Poland's PGNiG and Cheniere Marketing signed a long-term agreement for LNG on a delivered ex-ship (DES) basis from Sabine Pass, Louisiana and Corpus Christi, Texas in the United States. In 2019 - 2022 the volume will total approximately 0.52 million tonnes, while in 2023-2042, the import volume will be 1.45 million tonnes per year.

Bechtel and Cheniere Energy announced production of the first LNG from the Corpus Christi Liquefaction project in Texas. The Sabine Pass Liquefaction (SPL) project in Louisiana produced the first LNG from its fifth train. SPL also entered into an Engineering, Procurement, and Construction (EPC) contract with Bechtel for Train 6.

Sempra Energy's Cameron LNG initiated the commissioning process for the support facilities and first liquefaction train. Phase 1 includes three liquefaction trains expected to be producing LNG in 2019.

Toshiba Corporation agreed to sell its Toshiba America LNG Corporation (TAL) to ENN Ecological, a unit of ENN Group.

FERC (Federal Energy Regulatory Commission) Staff released a draft environmental impact statement (EIS) for the Plaquemines LNG and Gator Express Pipeline Project proposed by Venture Global. The facilities would have a design production capacity of 20 million tonnes per year. FERC Staff also released draft EIS for the Eagle LNG

Jacksonville Project in Florida and Kinder Morgan's Gulf LNG project in Mississippi.

PETRONAS and Vitol signed binding Heads of Agreement (HOA) for long-term LNG sale and purchase (SPA) agreement. The supply will be up to 0.8 million tonnes per year for a period of up to 15 years from 2024 on both Delivered Ex-Ship (DES) and Free on Board (FOB) basis primarily coming from LNG Canada.

Sempra Energy and Total entered into an MOU on cooperation in the development of North American LNG export projects. The MOU covers continuing development of the Cameron LNG project in Louisiana and Energía Costa Azul (ECA) project in Baja California, Mexico. The MOU contemplates Total potentially contracting for approximately up to 9 million tonnes per year of LNG offtake across Sempra's LNG projects, including Cameron LNG Phase 2 and ECA LNG.

Sempra subsidiaries IEnova and Sempra LNG & Midstream signed three Heads of Agreements (HOAs) with Total, Mitsui & Co., and Tokyo Gas for the full export capacity of Phase 1 of the Energía Costa Azul LNG (ECA LNG) project in Baja California, Mexico. ECA LNG Phase 1 is a single-train liquefaction facility expected to produce approximately 2.4 million tonnes per year of LNG. A final investment decision (FID) for ECA LNG is targeted in late 2019 with potential first LNG deliveries in 2023. Tokyo Gas will have access to 0.8 million tonnes per year of LNG for 20 years on a Free on Board (FOB) basis with full destination flexibility and a North American gas price index from the project.

[Middle East]

Saudi Aramco and the Abu Dhabi National Oil Company (ADNOC) signed a framework agreement to explore opportunities for collaboration in the natural gas and LNG sector.

The Abu Dhabi National Oil Company (ADNOC), agreed, in principle, to extend to 2040 its gas supply agreement with ADNOC LNG. ADNOC LNG has signed seven term contracts for the supply of more than 4.2 million tonnes per year of LNG. The contracts, that cover the supply of LNG on a mid-term basis starting April 2019, have been signed with various international well-established LNG buyers, including Japan's JERA that announced, in August 2018, it plans to purchase up to 8 cargoes per year of LNG from ADNOC LNG, for three years.

Wintershall will take a 10% stake in the Ghasha Concession off the coast of Abu Dhabi alongside the Abu Dhabi National Oil Company (ADNOC). Eni is a 25% partner.

Qatar named new heads of Qatar Petroleum (QP). Sheikh Abdullah bin Hamad al-Thani was named chairman of QP. Saad al-Kaabi, the chief executive of QP, was named minister of state for energy affairs.

Oman Power and Water Procurement Company (OPWP) issued a call for companies to bid for a contract to conduct a gas import and contracting study.

[Africa]

Golar LNG Limited said that it was in talks with Nigerian authorities about setting up a power project that could use one of its vessels to import LNG. Greenville inaugurated its first phase of LNG plant with a daily capacity of 2,250 tonnes in Rumuji, River State, Nigeria. The plant would produce about 750,000 tonnes per year.

Ghana's LNG import project is under construction with two vessels contracted to store and regasify the fuel by the second quarter of 2020.

The partnership of BP and Kosmos Energy reached agreement with the governments of Mauritania and Senegal on the non-PSA fiscal terms for the cross-border Tortue project. The project remains on track for phase 1 FID around year-end 2018.

[Europe / Russia]

Cuadrilla began to see natural gas flow to the surface from its shale exploration well at the Preston New Road site in England.

PitPoint.LNG - a joint venture between PitPoint clean fuels and Netherlands gas company Primagaz - received approval from the German government to construct what it claims will be "Europe's first shore-to-ship" LNG bunkering station. Uniper subsidiary LIQVIS opened its first permanent public filling station for LNG in Grünheide just outside Berlin. This is the first filling station that LIQVIS has established through the EU's "Connecting Europe Facility (CEF) for Transport" program.

The construction of a new LNG terminal in Finland's southern port of Hamina will be concluded by the end of 2020, Wärtsilä said.

Spain's Enagás and Ence signed an agreement to develop projects that aim to obtain renewable gases from biomass. The goal is to use biomass to generate green hydrogen and synthetic natural gas. Spain's regulator CNMC (la Comisión Nacional de los Mercados y la Competencia) advised against the construction of an LNG regasification terminal in Tenerife.

Shell has completed construction of the LNG regasification terminal in Gibraltar and conducting the commissioning process of the terminal and the adjacent power plant.

The Polish and Danish gas transmission system operators: GAZ-SYSTEM and Energinet made positive investment decisions and agreed to implement the joint Baltic Pipe project to transport natural gas from Norway through Denmark to Poland as well as transport gas from Poland to Denmark and Sweden. Gas transmission will start in October 2022.

LNG Croatia selected Golar Power as the provider of the Floating Storage &

Regasification Unit (FSRU) with operation and maintenance services. The *Golar Viking* LNG Carrier, built in 2005, will be converted to a new FSRU. The terminal is expected to be operational by January 2021.

From January to November 2018 Russia's Gazprom exported 179.9 bcm of gas, 4.5 bcm (2.6%) more than in January - November 2017. Gazprom and OMV signed an amendment to the contract on gas supplies to Austria to increase gas deliveries to Austria by 1 bcm per year for the entire contract period. In June 2018, an agreement was signed to extend until 2040 the existing contract between the two.

NOVATEK shipped a cargo of LNG produced from the Yamal LNG project to China National Offshore Oil Corporation (CNOOC). The LNG cargo was delivered to Fujian LNG Terminal in China via the Northern Sea Route (NSR) by an Arc7 ice-class LNG carrier in 20 days. Yamal LNG commenced initial production at its third train.

Norwegian shipping company Tschudi plans to transship up to 9 million tonnes of LNG during the first six months of 2019. Yamal LNG completed the first ship-to-ship LNG transshipment in the area near the port of Honningsvåg in northern Norway. Teekay LNG moved three to five months ahead of schedule the delivery date for four ice-classed LNG carriers to serve Yamal LNG in 2019.

[South America]

EXMAR and YPF signed a ten-year tolling agreement to deploy EXMAR's barge-based floating LNG liquefaction unit (FLNG) to export LNG from the Vaca Muerta source in Argentina. The FLNG barge will be named Tango FLNG and be located at the port of Bahía Blanca.

The government of Trinidad and Tobago reached an agreement with BP and Shell. The agreement involves new pricing arrangements, the extension of the Atlantic LNG Train 1 by a further five years after 2019.

[Global issues]

IEA's World Energy Outlook 2018 said "the risk of an abrupt tightening in LNG markets in the mid-2020s has been eased by major new project announcements, notably in Qatar and Canada."

Reference: Company announcements, Reuters, Punch Nigeria, El Diario, Bunkerspot, HIGH NORTH NEWS, The Guardian Trinidad and Tobago, Cedigaz News Report.

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