

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

Introduction

Northeast Asia's overall LNG prices were the highest in October 2018 since 2014 and are expected to stay in high levels for the next couple of months as the JCC (Japan's average crude oil import price) came near to USD 80 / bbl in October. On the other hand, although spot LNG prices in the region stayed above the levels in the last four years in October 2018, they began to stabilize due to slightly warmer weather and higher storage levels in the markets ahead of winter.

According to the two countries' custom statistics, during the first ten months of 2018, China imported 72.06 million tonnes of natural gas (including pipeline gas supply and LNG), a 33% increase over the same period in 2017, compared to 69.26 million tonnes or a tiny decrease by Japan. Meanwhile Korea increased LNG imports by 18%, or 5.46 million tonnes year-on-year in the ten-month period in 2018. During the month of October, the Ichthys LNG project in Australia started exporting LNG.

Thanks to increases demand in Asia, the world is expected to trade 310 million tonnes of LNG in the year.

There were notable discussions on flexibility and security in the LNG market in the month. A hybrid approach that ties term-contract LNG prices to multiple indices was the most favoured by attendees at the annual LNG Producer-Consumer Conference in Nagoya Japan. Japan's and the European Commission's expert group proposed wording for LNG contracts to enhance flexibility and leads to a more liquid market. The International Energy Agency's (IEA) third annual Global Gas Security Review emphasized that supply flexibility remains a key prerequisite to ensure further global gas trade development and security.

This paper looks at important issues in the LNG industry in October.

[Asia Pacific]

The Japanese government along with companies have spent USD 4 billion in the past year on LNG projects, mainly in Asia and across the supply chain, to help spur demand

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for the fuel, Japan's Trade Minister said at the LNG Producer-Consumer Conference.

Tepco Fuel and Power Company started commercial operation of a city-gas heating value adjusting facility installed at the site of the Anegasaki Gas-fired Power Station. The new facility is capable of sending out 600,000 tonnes per year equivalent of city-gas utilising transmission services provided by the city-gas grid operator.

Pavilion Energy signed an agreement with BW Group (BW) for the long-term charter of two M-type, Electronically Controlled, Gas Injection (MEGI) LNG newbuilds. The 173,400 m³ vessels are scheduled for delivery between 2019 and 2020.

The Philippines has short-listed three groups to build and operate its first LNG import terminal, its energy minister said.

According to China's NDRC (National Development and Reform Commission), the country's natural gas production, import and consumption grew by 6.3%, 37.6%, and 18.2% year on year to 115.6 bcm, 88.6 bcm and 2017 bcm, respectively, during the first three quarters of 2018.

CNPC (China National Petroleum Corporation) finished injecting gas into its underground storage, with more than 9 billion cubic metres pumped into a total of 10 underground facilities by October 2018, 22% more than a year earlier.

Total and CNOOC (China National Offshore Oil Corporation) signed an amendment to their existing LNG sale and purchase agreement (SPA), increasing the annual contract volume from 1 million tonnes to 1.5 million tonnes and extending the term from 15 years to 20 years.

ENN Group's Zhoushan LNG receiving terminal in Zhejiang Province began commercial operation with arrival of a 69,000 tonne LNG cargo from Australia.

The environmental impact assessment (EIA) committee of Chinese Taipei approved CPC plan to build its third LNG receiving terminal in the Kwun Tong Industrial Port, which had been strongly opposed by the ecological conservation group, after the company reduced the development area twice.

Total and Adani Group signed an agreement to jointly develop multi energy offers to the Indian energy market. The cooperation includes LNG and Fuel Retail.

ACCC (Australian Competition and Consumer Commission) started publication of LNG netback prices in order to boost transparency. An LNG netback price is an export parity price that a gas supplier can expect to receive for exporting its gas.

According to the state of Victoria, Australia, the proposed Crib Point Gas Import Facility and adjoining pipeline by AGL and APA will undergo an Environmental Effects Statement (EES).

The Australian Government released its final response to the review of the

Petroleum Resource Rent Tax (PRRT) in early November 2018. The changes, to be introduced from July 2019, include: Lower uplift rates; Onshore projects removal from the PRRT regime; and Review of Gas Transfer Pricing Regulations. The new uplift rates and removal of onshore projects are expected to raise AUD 6 billion over the next decade.

China's Zhenhua Oil purchased its first LNG cargo from Chevron to supply CNOOC's Yuedong terminal in Shenzhen. Zhenhua and its local partner Longkou agreed in September to use the terminal.

Woodside signed a Cooperation Agreement with ENN Group to explore a broad range of potential business opportunities.

Woodside, as Operator of the North West Shelf (NWS) Project, advised that the Greater Western Flank Phase 2 (GWF-2) Project off the north-west coast of Australia had commenced gas production.

Woodside on behalf of the Browse JV awarded KBR the Concept Definition engineering contract for the two gas FPSO facilities for the proposed Browse to North West Shelf Development. The engineering work is expected to be completed by the end of H1 2019.

Woodside selected Bechtel as the preferred execution contractor for the proposed expansion of its Pluto LNG facility in Western Australia. Woodside plans a brownfield expansion of the Pluto LNG facility, including construction of a second LNG train with a targeted capacity of 4 - 5 million tonnes per year, to facilitate development of the Scarborough gas resource. Woodside is targeting FEED entry in Q1 2019 and a final investment decision (FID) in 2020, with Train 2 targeted to be ready for start-up in 2024.

The first LNG shipment from the INPEX-operated Ichthys LNG Project in Australia arrived at INPEX's Naoetsu LNG Terminal in Joetsu City, Niigata Prefecture, Japan. The shipment of LNG followed the project's shipment of condensate earlier in October.

ConocoPhillips entered into an agreement to sell to the government of Timor-Leste its 30% interest in the Greater Sunrise Fields.

JX Nippon Oil & Gas Exploration (Malaysia), the operator of Block SK10 offshore Sarawak, Malaysia together with PETRONAS Carigali, commenced commercial gas production from Beryl Gas Field in September 2018. The produced gas is supplied to the MLNG Tiga liquefaction plant in Bintulu, Sarawak.

Malaysia's Petronas supplied its first LNG to the LNG bunker vessel Kairos at the Regasification Terminal Pengerang (RGTP) in Johor on its way from a Korean yard to Europe.

The Japan Bank for International Cooperation (JBIC) signed a loan agreement for project finance of USD 604 million (JBIC portion) with PT Jawa Satu Power (JSP) and PT Jawa Satu Regas (JSR) for the Jawa 1 Gas-to-Power Project in Indonesia. JSP will construct, own and operate a gas-fired combined cycle power plant while JSR will construct, own and

operate a floating LNG storage and regasification unit (FSRU).

Osaka Gas established its subsidiary company PT OSAKA GAS INDONESIA in Indonesia and signed a joint marketing agreement with Pertamina Group's gas marketing company PT Pertagas Niaga.

[North America]

Working natural gas in storage in the Lower 48 states in the United 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.

Due to increased construction cost for ongoing LNG projects, notably the Cameron LNG Project in Louisiana, Chiyoda Corporation revised down its forecasts of performance in the fiscal year ending in March 2019. The project initiated the commissioning process for the support facilities and first liquefaction train of Phase 1. Phase 1 includes the first three liquefaction trains expected to be producing LNG in 2019.

The first of 10 units at the Elba Liquefaction Project is expected to be placed in service in the first quarter of 2019, with the remaining nine units to come online throughout 2019, according to Kinder Morgan.

Tellurian plans to lower the equity buy-in for potential partners in a bid to make its business model of its proposed Driftwood LNG export project more attractive. Tellurian plans to retain as much as 11.6 million tonnes per year or 40% of Driftwood's capacity.

NextDecade announced that the Federal Energy Regulatory Commission (FERC) issued a draft environmental impact statement (EIS) for NextDecade's Rio Grande LNG project in South Texas, as well as the associated Rio Bravo Pipeline. NextDecade anticipates a final investment decision (FID) in the third quarter of 2019. McDermott International plans to partner with Saipem to submit a joint EPC proposal in the second quarter of 2019 for the Rio Grande LNG project.

PGNiG (Polish Oil and Gas Company) and Venture Global LNG announced LNG Sales and Purchase Agreements for 2 million tonnes per year for 20 years. PGNiG will purchase LNG on a free on board (FOB) basis starting from the commercial operation date of the Venture Global Calcasieu Pass LNG export facility, currently expected in 2022, and the commercial operation date of the Venture Global Plaquemines LNG export facility, currently expected in 2023. FERC released the final environmental impact statement (EIS) for the liquefaction and export terminal, and an interconnected pipeline.

Earlier in 2018, LNGL stated its target to make a final investment decision (FID) for Magnolia LNG by the end of the year. The company is still hopeful in its ability to bring an

FID to the Board of Directors in the first part of 2019.

Black & Veatch and Kiewit Energy Group made an equity investment in the Annova LNG export project in Brownsville, Texas. Concurrently, Black & Veatch and Kiewit were awarded the engineering, procurement and construction (EPC) contract for the Annova LNG 6 million tonnes per year project. Annova LNG commercial operations is scheduled for 2024.

FERC issued its Draft Environmental Impact Statement (DEIS) to Texas LNG Brownsville. The DEIS is another milestone towards the project's final investment decision (FID) on the first 2 million tonne per year phase of the project.

Crowley Maritime christened its container/roll on-roll off ship El Coquí, the first of its kind to be powered by LNG. The ship will service the company's United States - Puerto Rico trade route. Sister ship Taino is in final phases of construction and expected to be delivered later in 2018.

Alaska Gasline Development Corporation (AGDC), Sinopec, CIC Capital, and Bank of China, signed an agreement supplementing the Joint Development Agreement that was signed in November 2017, reaffirming the parties' intent to negotiate and conclude definitive agreements by December 2018.

Tokyo Gas and Toho Gas respectively signed heads of agreement (HOAs) for LNG from LNG Canada Project with Diamond Gas International (DGI). Tokyo Gas will purchase up to 0.6 million tonnes per year for 13 years starting in 2026 and Toho Gas will purchase 0.3 million tonnes per year for 15 years starting in fiscal year 2024, respectively, on delivered Ex-Ship (with destination flexibility) conditions.

Canada's National Energy Board (NEB) said it will consider a jurisdictional challenge against approval of TransCanada's Coastal GasLink Pipeline project from the British Columbia Oil and Gas Commission. The challenger argues that because TransCanada operates the pipeline and the Nova Gas Transmission system together, they are effectively a single federal undertaking.

Pieridae Energy's proposed financing of upstream activities within the Goldboro LNG project received a written confirmation of eligibility in principle for up to USD 1.5 billion of untied loan guarantee by the German federal government under its UFK program (Bundesgarantien für ungebundene Finanzkredite). The Nova Scotia Utility and Review Board approved the construction of the facilities. Pieridae Energy has already received environmental approval and a final investment decision is expected by June 2019.

The Energía Costa Azul LNG (ECA) project in Mexico is expected to receive a final investment decision in 2019, Sempra LNG & Midstream said.

[Middle East]

Teekay LNG's first Floating Storage Unit (FSU) was delivered to charterer Bahrain LNG. The vessel will be used to support Bahrain LNG in providing an LNG receiving and regasification terminal in Bahrain. The project is 30% owned by Teekay LNG Partners (TGP) and is expected to commence commercial operation in early 2019.

Iran's South Pars gas field's phases 22, 23, 24 of development have 91% progress, according to the operator Pars Oil and Gas Company (POGC).

Malaysia's Petronas said its subsidiary PC Oman Ventures Limited would buy a 10% stake in Oman's Al Khazzan gas field from Oman Oil Company Exploration and Production (OOCEP), the exploration arm of Oman Oil Company (OOC).

Oman LNG is planning to increase production capacity from 9.9 million tonnes to around 11 million tonnes per year as the starting of production from Khazzan gas projects raised the prospects for additional gas availability.

[Africa]

Sonatrach and Total signed two agreements: A new concession contract to jointly develop the Erg Issouane gas field on the TFT Sud permit. The partners also signed a shareholder agreement to create a joint venture known as STEP (Sonatrach Total Entreprise Polymères), which will be responsible for carrying out a joint petrochemical project in Arzew.

Höegh LNG and Egypt Natural Gas Holdings Company (Egas) agreed to amend the *Höegh Gallant* time charter. The ship will be chartered as an LNG carrier to a third party, and Egas will compensate for the rate difference. The amended contract will run to April 2020, the termination date of the original five-year FSRU contract.

Ghana's LNG import project is under construction with two vessels contracted to store and regasify LNG by the second quarter of 2020, a project partner said. China Harbour Engineering Company has already begun construction work on a marina with a Floating Regasification unit (FRU) to be provided by the CSSC Jiangnan shipyard and a Floating Storage Unit by Gasfin, Gasfin's chief executive said. Russia's Rosneft has a 12-year deal to supply 1.7 million tonnes per year with Ghana National Petroleum Corporation (GNPC).

According to Kosmos Energy, the first phase Unit Development Plan of the Tortue LNG development in Senegal and Mauritania has been submitted by BP and Kosmos to the energy ministries of both countries. KBR was awarded a Front End Engineering Design (FEED) contract by BP for Phase 1. The FEED work is to be performed by the end of 2018.

Tohoku Electric Power entered into an LNG Sales and Purchase Agreement with Mozambique LNG 1 Company. Tohoku will purchase a maximum of 0.28 million tonnes per year over 15 years from the project.

[Europe / Russia]

The British government released a further set of Brexit contingency plans outlining the potential impacts of a no deal split. Operators of electrical power links with Europe will need to set up alternative trading arrangements in a no-deal Brexit. A separate paper said gas trading was not expected to change significantly in the event of a no-deal Brexit.

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

Shell recently delivered its first ship-to-ship bunkering of LNG from its specialised LNG bunker vessel *Cardissa* in the Port of Rotterdam. It fuelled the Sovcomflot vessel *Gagarin Prospect*, the world's first LNG-powered Aframax tanker.

Fluxys, AXA Investment Managers - Real Assets, and Crédit Agricole Assurances closed the transaction to jointly acquire from EDF and Total a 35.76% stake in Dunkerque LNG. Fluxys and its partners hold a 60.76% stake in the facility. EDF and Total also sold their remaining 39.24% stake to a consortium of Korean investors led by IPM Group in cooperation with Samsung Asset Management.

The Trading Region France (TRF), France's new single natural gas trading zone, launched on 1 November 2018 after the merging of the Peg Nord and Trading Region South (TRS) hubs.

A joint venture between NOVATEK and Fluxys signed a Land Lease Agreement with the Rostock Port for construction of a mid-scale LNG transshipment terminal in Germany. The joint venture will construct the terminal with capacity of 300,000 tonnes per year. The terminal will receive LNG carriers from the Cryogas-Vysotsk liquefaction facility that NOVATEK is currently constructing in the port of Vysotsk located near the Saint-Petersburg area and further LNG deliveries to the consumer market will be made via trucks. The terminal will also have an option of bunkering and loading of bunkering vessels.

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. The station will be built at the Port of Cologne and is scheduled to come into operation in Q2 2019. The facility will bunker inland waterways vessels that sail on the Rhine.

AIDA Cruises announced that the *AIDAnova* cruise ship was transferred from the Meyer shipyard in Papenburg, Germany, and to Eemshaven (the Netherlands). The vessel is the world's first cruise ship capable of being fuelled by LNG both at sea and in port. AIDA Cruises confirmed Shell's LNG bunker barge *Cardissa* carried out the first LNG bunker for a cruise ship, refuelling the *AIDAnova* at the port of Eemshaven with about 3,500 m³ of LNG.

Keppel Offshore & Marine signed two additional contracts with Stolt-Nielsen Gas, after the latter exercised its options to build two additional small-scale LNG carriers.

Finland's Gasum increased its shareholding in Skangas to 100%, consolidating Gasum's position as the leading Nordic LNG provider. Skangas entered into an agreement with Gothia Tanker Alliance to supply LNG as a fuel at ports and bunkering facilities as well as at sea via Skangas' LNG bunkering vessel *Coralius*.

Bilbao shipyard Zamakona delivered Spain's second LNG bunker vessel - *Bunker Breeze* - to compatriot shipping company Suardiaz Energy. The vessel will enter service in the southern Spanish port of Algeciras in November 2018, on charter to Cepsa.

Greece's Gastrade, developer of the Alexandroupolis LNG import terminal, launched the first phase - a non-binding, expression of interest phase - of a market test for the terminal. Interested parties have 45 days to express their interest.

The government of Cyprus issued a tender for an LNG import terminal, including a floating storage and regasification unit (FSRU), offshore infrastructure for permanent berthing of the FSRU, and onshore infrastructure and related construction components for gas delivery to the Vasilikos power station and potentially other gas consumers.

Sovcomflot crude oil tanker *Gagarin Prospect*, operating on LNG fuel, completed her voyage across the Baltic and North Seas from Primorsk to Rotterdam. *Gagarin Prospect* is the world's first Aframax crude oil tanker designed to operate on LNG as the primary fuel.

During the first ten months of 2018, Gazprom's exports to the Far Abroad countries increased by 4.4% year-on-year to 164.1 bcm of gas.

Saudi Arabia's energy minister said the kingdom aims to acquire 30% of Novatek's Arctic 2 LNG project. TechnipFMC is in the final stages of delivering the FEED study on Arctic LNG 2 to Novatek.

NOVATEK announced that its subsidiary OOO Arctic LNG 3 has completed the testing of the first exploration well at the North-Obskiy license area in the Ob Bay.

Gazprom continues to prepare the Kovyktinskoye field to move from development to full-scale production. In 2019, Gazprom intends to prepare sites for production wells and to commence drilling. The company plans to start feeding gas from Kovyktinskoye into the Power of Siberia gas pipeline in late 2022.

Russia's Gazprom chief said that the company expects to start buying gas from Turkmenistan starting in January 2019.

Reference: Company announcements, Reuters, 中央通訊社, Tehran Times, Muscat Daily, Cedigaz News Report.

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