

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

Introduction

China was the largest importer of natural gas (pipeline gas and LNG combined) in the world for the first half of 2018, bringing in 42.08 million tonnes, slightly more than Japan's LNG import of 42.05 million tonnes during the same period, according to preliminary figures from the two countries' respective customs authorities. Japan paid USD 20 billion for the volumes (10% more amount for 2.7% less volumes than a year earlier), while China paid USD 16.5 billion. China imported 23.81 million tonnes of LNG alone in the period, 50% more than it did a year earlier.

Northeast Asia as a whole (Japan, China, Korea and Chinese Taipei combined) 12% more LNG, or 97 million tonnes, was imported during the first six months of 2018, for which the four importers paid over 30% more than a year earlier. 80% of the volume growth came from China. China's overall gas imports grew by 18% in the first half of 2018, compared to the same period in 2017. The country's gas consumption is expected to have grown by 18% during the period.

Gas demand also increased in Spain, another big LNG market, by 5.9%, while LNG imports by Spain, as well as Europe, decreased in the first half of 2018.

On the LNG production front, Australia led the LNG expansion in the first half of 2018, shipping out more than 30 million tonnes, approximately 20% more. The United States shipped out 8.7 million tonnes of LNG during the first five months of 2018, over 60% more than it did during the same period of 2017.

Russia had some positive numbers in its gas and LNG production in the first half of 2018, including Gazprom's 9% increase in gas production and Yamal LNG's more than 2 million tonne LNG production.

Asian LNG spot prices were traded higher in June 2018 compared to the same month in the last three years, peaking at over USD 11 / million Btu in the middle of the month.

This paper looks at some of major developments in the global LNG industry in June 2018.

* The writer belongs to Gas Group, Fossil Fuels and International Cooperation Unit. Some information pieces that some readers may consider very important may not be included due to different reasons.

[Asia Pacific]

Northeast Asia's average LNG import price is approaching USD 10 / million Btu. As Japan's average crude oil import prices (JCC) in May and June 2018 were over USD 70 / bbl for the first time since 2014, LNG import prices may rise again in August.

S&P Global Platts said that several LNG players and trading companies have joined Asia JKM LNG physical MOC, the price assessment process for Asian LNG.

Japan's policy advisory committee made recommendations including ideas to promote competition in the recently liberalised city-gas retail market: [1] range, rather than standard, heating value regulations; [2] acceptance of aggregation of customers; [3] introduction of gas wholesale services; [4] improving gas transportation tariff; [5] a more competitive market for safety management and installation and maintenance services of inhouse pipes; and [6] promotion of third-party use of LNG terminals.

According to Japan's Agency for Natural Resources and Energy (ANRE), Ministry of Economy, Trade and Industry (METI), 1,118,705 customers had switched their city-gas retail suppliers by the end of June 2018 since the full liberalisation of the nation's city-gas retail market after April 2017.

Seven-Eleven Japan - the nation's largest convenience store chain - and Toyota Motor Corporation announced a joint project to reduce CO₂ emissions. The project will be implemented in stages starting in 2019. Stationary fuel cell generators (FC generators) and rechargeable batteries will be introduced at stores. A newly developed small fuel cell truck (small FC truck) will be introduced in the merchandise distribution process.

The Maritime and Port Authority of Singapore (MPA) awarded SGD 6 million to FueLNG and Pavilion Gas for the building of two LNG bunker vessels. Total and Pavilion signed Heads of Agreement (HoA) to jointly develop an LNG bunker supply chain in the port of Singapore. The agreement covers the shared long-term time charter of a new generation LNG bunker vessel (LNGBV) to be commissioned by Pavilion by 2020. It also includes an LNG supply arrangement between the two companies

Trafigura and Singapore LNG (SLNG) signed an agreement in May 2018 for Storage and Reload Services at the SLNG Terminal. This is the second such agreement that Trafigura signed with SLNG to utilise the excess storage capacity at the terminal. Trafigura will have access to 160,000 m³ of capacity on a segregated basis for the next 24 months.

Saipem, in Joint Venture with CTCI Corporation, was awarded a new contract in the Onshore E&C sector in the Mueang Rayong district, in the southeast of Thailand by PTT, including the engineering, procurement, construction and commissioning of the Nong Fab LNG terminal, with a maximum receiving capacity of 9 million tonnes per year.

The Philippines' Phoenix Petroleum signed a memorandum of understanding (MOU)

with China National Offshore Oil Corporation (CNOOC) to study, plan, and develop an LNG receiving terminal and gas-fired power plant project in the Philippines. Korea's SK E&S signed a letter of intent (LOI) with the Philippine Department of Energy to build LNG infrastructure in the Southeast Asian country. SK E&S presented a blueprint to the Philippine government for facilities on the northern island of Luzon, including an LNG terminal, 600 MW of LNG-fired power capacity, and up to 150 km of connecting pipeline.

During the first five months of 2018, China consumed 112.7 bcm of natural gas, 17.6% more than the same period one year ago, according to the NDRC (National Development and Reform Commission).

Höegh LNG signed a time charter for the floating storage and regasification unit (FSRU) *Höegh Esperanza* with CNOOC for three years. Höegh Esperanza will be utilised in FSRU mode at the Tianjin LNG terminal in China for no less than an agreed-upon minimum period each year, with the balance of the year in LNGC mode and/or FSRU mode.

Mitsui O.S.K. Lines (MOL) entered into a preliminary agreement to supply a Floating Storage and Regasification Unit (FSRU), as well as Jetty Operation & Maintenance Services for the Hong Kong Offshore LNG Terminal Project from 2020. MOL will utilize the "*MOL FSRU Challenger*" constructed at Daewoo Shipbuilding & Marine Engineering (DSME) in Korea in 2017 with a storage capacity of 263,000 m³ which remains the largest FSRU in the world, to provide services to the project.

The plan for Chinese Taipei's third LNG receiving terminal was rejected in early July 2018 by a government environmental committee, which cited a likely "grave impact" on the ecology of rare algae and coral species.

In early June 2018, the first tanker with LNG cargo arrived at the port of Dahej (Gujarat state in North-West India) under the long-term contract between Gazprom Marketing and Trading Singapore (GMTS) and GAIL which was signed in August 2012.

Qatar's Nakilat signed an agreement with Excelerate Energy to establish a joint-venture company and acquire a 55% interest in a floating storage regasification unit (FSRU). The vessel is located at Port Qasim in Pakistan, and has received 10.4 million tonnes of LNG since it started operations in 2015, out of which 7.8 million tonnes were Qatari LNG.

The Australian Energy Market Operator's (AEMO) 2018 Gas Statement of Opportunities (GSOO) provides a 20-year outlook for Australia's east coast. A change in international market dynamics, lower demand for gas-powered generation, new pipeline interconnections and the Federal Government's Australian Domestic Gas Supply Mechanism (ADGSM) have delivered an improved outlook for Australia's east-coast gas markets. Australian LNG exports climbed to a new high of nearly 60 million tonnes in 2017 - 18, an increase by 20%. Japan was the biggest LNG customer, accounting for 45% of deliveries.

Australian Industrial Energy (AIE) selected Port Kembla as the site for an LNG import terminal to be named the Port Kembla Gas Terminal (PKGT) with capacity in excess of 100 PJ per year (1.8 million tonnes). AIE has entered into 12 Memorandums of Understanding (MoU's) for the supply of gas. The AIE consortium comprises Squadron Energy, Marubeni Corporation and JERA.

AGL Energy executed two key sets of agreements in relation to its proposed LNG import jetty at Crib Point in Victoria: Development and Gas Transportation Agreements with APA Group; and Works, Lease, and Berthing and Jetty Agreements with the Port of Hastings Development Authority. ExxonMobil is also considering importing LNG in Victoria, Australia. ExxonMobil could use its existing infrastructure at Longford in Victoria for the LNG import facility.

Chevron-led Wheatstone Project commenced LNG production from Train 2 at its onshore facility near Onslow, Western Australia.

ConocoPhillips awarded three engineering contracts for the front-end engineering design (FEED) phase on the Barossa offshore project to provide a new source of gas to the Darwin LNG (DLNG) facility.

Malaysia's Petronas filed an application before the Federal Court seeking for a declaration on the Petroleum Development Act 1974 (PDA) being the law applicable for the petroleum industry in Malaysia, and that Petronas is the exclusive owner of the petroleum resources as well as the regulator for the upstream industry throughout Malaysia, including in Sarawak. Petronas successfully delivered its LNG cargo through its maiden break bulking ship-to-ship (STS) transfer in Brunei Bay.

Shell completed the sale of its 15% shareholding in Malaysia LNG Tiga (MLNG Tiga) to the Sarawak State Financial Secretary (SFS). The transaction has an economic date of 1 September 2017. SFS is an existing MLNG Tiga shareholder and with completion of this transaction, increased its shareholding in MLNG Tiga to 25%. The other shareholders of MLNG Tiga are PETRONAS with 60% equity, Nippon Oil Finance (Netherlands) B.V. with 10% equity, and Diamond Gas (Netherlands) B.V., a Mitsubishi Corporation subsidiary with 5% equity. Following the expiry of the MLNG Satu and Dua joint venture agreements, MLNG Tiga was Shell's only remaining interest in the Petronas LNG complex.

Chiyoda Corporation and PT Synergy Engineering were awarded a Pre-FEED contract by INPEX for the SURF (Subsea Umbilicals Risers and Flowlines) and GEP (Gas Export Pipeline) facilities of the Abadi LNG Project in Indonesia.

Repsol agreed to sell its shares in the Repsol entities holding its Papua New Guinea assets to Balang International. This includes Repsol's approximately 40% interest in the Elevela /Ketu and Stanley fields, being the foundation fields for the standalone gas

aggregation project, Western LNG. Balang is part of the China Changcheng Natural Gas Power Co. Ltd Group (Changcheng Group).

During the second quarter of 2018, discussions continued between the PNG LNG Project and the P'nyang (PRL 3) and Papua LNG (PRL 15) joint ventures on further LNG developments. The government has established a State Negotiation Team (SNT), responsible for negotiating gas agreements with the Papua LNG and P'nyang joint ventures, respectively. During the quarter, ExxonMobil, on behalf of the PNG LNG, continued to negotiate terms with shortlisted parties for additional LNG supply agreements. Oil Search commenced market engagement with potential LNG buyers for offtake from its equity share of LNG from the proposed Papua LNG Project.

[North America]

The United States Department of Energy's (DOE) Office of Fossil Energy (FE) issued a policy statement regarding long-term authorizations to export LNG to nations without a Free Trade Agreement (non-FTA nations) with the United States. DOE/FE affirms its commitment to all export authorizations issued under the Natural Gas Act, including long-term authorizations approving the export of LNG to non-FTA countries.

CPC Corporation, Taiwan, announced the signing of a heads of agreement (HOA) for a long-term LNG contract with Cheniere for 2 million tonnes per year of supply over 25 years.

Osaka Gas entered into an agreement with Sabine Oil & Gas to acquire 35% of Sabine's interest in the gas properties primarily in Harrison and Panola Counties, Texas. Osaka Gas will obtain approximately 30% of the working interest in the formations in the shale assets. The project currently produces equivalent of 300,000 tonnes per year of LNG.

Freeport LNG entered into a binding mid-term sales and purchase agreement (SPA) with Trafigura for 0.5 million tonnes per year. The SPA with Trafigura will commence in July 2020, soon after the expected completion of construction of the third liquefaction train.

Bechtel was selected by Sempra's Port Arthur LNG, as the engineering, procurement, construction and commissioning (EPC) contractor for the liquefaction project under development in Jefferson County, Texas. Polish Oil & Gas Company (PGNiG) and Port Arthur LNG entered into an agreement, which defines basic terms and conditions of a 20-year contract for 2 million tonnes per year of LNG.

PGNiG and Venture Global LNG entered into a basic agreement for another 20-year and 2 million tonne per year deal. Cargoes will be supplied from Calcasieu Pass and Plaquemines LNG export facilities which are expected to be completed in 2022 and 2023 respectively. The 12 million tonne per year Calcasieu Pass project received a draft environment impact statement from the Federal Energy Regulatory Commission (FERC).

Australia's Liquefied Natural Gas Limited (LNGL) entered into a binding subscription agreement with IDG Energy Investment Group for a Share Placement. IDG Energy Investment will hold a 9.9% interest in LNGL. Net proceeds from the Share Placement will be used in support of LNG marketing efforts, focused on the proposed Magnolia LNG project in Lake Charles, Louisiana, and for general corporate purposes.

DOE issued an order authorizing Galveston Bay LNG, wholly-owned (100%) by NextDecade LNG, to export up to 785.5 Bcf/year (16 million tonnes per year) of LNG over 20 years from its proposed liquefaction facility to be located in Texas City, Texas. Galveston Bay LNG is authorized to export the LNG to nations with an FTA with the United States.

DOE also issued an order authorizing Blue Water Fuels to export up to 2.715 Bcf/year (56,496 tonnes per year) of domestically produced LNG over 25 years via ISO containers or in bulk, transported on vessels, to nations having an (FTA) with the United States. Blue Water seeks to purchase the LNG from the existing Nu Blue Energy Facility in Port Allen, Louisiana.

Sempra LNG & Midstream picked a TechnipFMC-Kiewit partnership as the engineering, procurement, construction and commissioning (EPC) contractor for the Energía Costa Azul liquefaction project under development in Baja California, Mexico.

[Middle East]

Saipem was awarded a Pipeline Project in the E&C Offshore sector in the Middle East worth approximately USD 1.3 billion.

KBR was awarded a Project Management Consultancy (PMC) Services contract by Oman LNG for a new 120 MW gas engine power plant which is aimed to reduce fuel gas consumption and greenhouse gas emissions while maintaining LNG production at Oman LNG's existing LNG plant in Sur, Oman.

[Africa]

Indonesia's Pertamina awarded to Bonatti the contract for the engineering, procurement, construction and installation, pre-commissioning, commissioning and assistance to start-up of the Gas Capacity Increase Project (GCIP) in MLN (Menzel Lejmat Nord) Field in Algeria, as part of Phase-4 Development Project.

Spain's Gas Natural Fenosa, which rebranded itself to Naturgy at the end of June 2018, renewed a deal to take natural gas from Algeria for another 12 years. GNF will buy the gas equivalent of more than 40% of its annual gas purchases from Algeria's Sonatrach. Sonatrach owns 4% of the Spanish company.

Nigerian National Petroleum Corporation (NNPC) and Morocco's National Office of Hydrocarbon and Mines signed agreements, which includes a regional gas pipeline that

should see Nigeria providing gas to countries in West Africa that extend to Morocco and Europe.

Tokyo Gas and Centrica jointly signed a non-binding Heads of Agreement (HoA) with the Mozambique Area 1 joint venture for long-term offtake of LNG. Tokyo Gas and Centrica will purchase 2.6 million tonnes per year, delivered ex-ship (DES) from the Mozambique LNG Project from the start-up of production until the early 2040s.

[Europe / Russia]

According to Cedigaz, European net LNG imports in the first half of 2018 fell by 5% (-1.21 million tonnes YoY) to reach 21.2 million tonnes

The European Commission opened a formal investigation to assess whether supply agreements between Qatar Petroleum (QP) companies exporting LNG and European Union (EU) importers have hindered the free flow of gas within the European Economic Area (EEA), in breach of EU antitrust rules.

The Netherlands' Economic Affairs Minister said in a letter to the parliament that gas extraction in Groningen could be reduced to below 12 billion cubic meters by 2020. Early in 2018 the state supervision on mines (SoDM) called on the government to reduce gas extraction to 12 bcm per year as quickly as possible. The government eventually decided to reduce gas extraction in the province to zero by around 2030.

Nor Lines allocated its two LNG-powered multipurpose vessels to a bi-weekly (liner) service from the SCA terminal in Rotterdam to the Norwegian coast. The LNG is delivered to the vessels by trucks. The Port of Rotterdam and Titan LNG have set up the site temporarily to bunker LNG to sea-going vessels until there are sufficient LNG bunker barges available.

Belgium's Zeebrugge LNG Terminal performed its first loadings of the *Coral EnergICE*. The newly built ice class vessel will be making regular calls for delivering small-scale LNG to Scandinavian ports. The vessel has a capacity of 18,000 m³ and is currently assigned to make year-round small-scale LNG deliveries to ports in Sweden and Finland.

Fluxys, AXA Investment Managers - Real Assets, and Crédit Agricole Assurances agreed to jointly acquire from EDF and Total a 35.76% stake in Dunkerque LNG. EDF and Total currently own 75% of the Dunkirk LNG terminal while Fluxys is 25% partner. Besides agreeing to sell a 35.76% stake in the facility to Fluxys and its consortium partners, EDF and Total also agreed to sell the remaining 39.24% stake to a consortium of Korean investors.

The European Commission found that Luxembourg allowed two Engie group companies to avoid paying taxes on almost all their profits for about a decade. Luxembourg must now recover about €120 million in unpaid tax.

The demand for natural gas in Spain grew by 5.9% year-on-year in the first half of

2018.

Croatia passed a law to enable the construction of an LNG terminal, which will be built on the island of Krk in the northern Adriatic Sea.

An agreement for the extension of Russian natural gas supply to Austria's OMV until 2040 was signed with Gazprom. Nord Stream 2 AG received the construction permit for the Russian section, from the Russian Ministry of Construction and Utilities. Another permit for construction of an underwater pipeline in the territorial sea of the Russian Federation should be obtained from the Russian Environmental Authority (Rosprirodnadzor). Germany, Finland and Sweden have granted all the necessary permits. The permitting procedure in Denmark is ongoing.

Russia's Yamal LNG shipped the first cargo of LNG to Spain's Naturgy (ex-Gas Natural Fenosa) under a long-term contract to the port of Mugardos. In the first half 2018, Novatek's LNG sales volumes to international markets amounted to 1.61 bcm.

Novatek and Korea Gas Corporation (KOGAS) signed a Memorandum of Understanding (MOU) on collaborating and developing future LNG opportunities. The parties agreed to explore opportunities for KOGAS to enter the Arctic LNG 2 project and possible LNG off-take from the project, participate in the LNG transshipment project in Kamchatka and other infrastructure projects.

[South America]

Panama's first Costa Norte LNG import terminal received a commissioning cargo from Cheniere's Sabine Pass plant. AES Colón has a 50.1% stake in the LNG-to-power project that includes a 380 MW combined-cycle gas turbine (CCGT). The other 49.9% share belongs to Inversiones Bahía.

Argentina will begin exporting natural gas to Chile before the end of 2018, the energy ministers of both countries said. The gas could come both from the Neuquén basin, home to Vaca Muerta, and from the Austral basin in southern Argentina.

[Global issues]

Over the past few months, S&P Global Platts and LNG trading marketplace Global LNG Exchange (GLX) advanced their respective initiatives to promote transparent LNG trades in their platforms.

Reference: Company announcements, Reuters, NL Times Netherlands, Estrategia & Negocios, TVN Panamá, EnergyQuest Australia, Cedigaz News Report.

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