

LNG Review October 2020 - Recent issues and events -

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Introduction

According to Japan's Customs Statistics, the country's LNG import in September 2020 amounted to 6.50 million tonnes, an increase year-on-year following the previous y-o-y increase in June. The cumulative import during the first nine months of the year amounted to 54.78 million tonnes, a y-o-y decrease of 5.47%. The average landed price for September was USD 5.51 per million Btu, the lowest since January 2005. Meanwhile, the average landed prices for September were USD 5.10 in Korea, USD 5.06 in China, and USD 4.86 in Chinese Taipei, respectively.

47 cargoes imported in Japan carried prices below USD 5 in September, compared to two in April, three in May, ten in June, nine in July and 31 in August. The weighted average delivered price of Qatari LNG of 0.63 million tonnes was USD 4.31, the lowest among different supply sources who supplied Japan multiple cargoes in September. Volumes from the Middle East - including Qatar, Southeast Asia, and Russia were priced around USD 5, while those from the United States were around USD 8.

While LNG prices in Northeast Asia mainly under long-term contracts on average probably reached the bottom in the near term in September, spot gas prices around the world, including assessed spot LNG prices sold into Northeast Asia, recovered during the third quarter reaching USD 7s for LNG in Northeast Asia and around USD 5 for gas in Europe for near-month delivery by late October, higher than the levels one year earlier, before the COVID-19 crisis.

Although no new final investment decisions have been announced for LNG liquefaction facilities so far this year (2020), several proposed LNG production projects have expressed their plans to accommodate more environmentally-friendly elements into their project development. Qatar's energy minister revealed that the country's mega-train expansion project will incorporate a CCS system and solar power generation as part of its basic design, at the LNG Producer-Consumer Conference in October 2020.

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

[Asia Pacific]

JERA submitted on 6 October 2020 the Primary Environmental Impact Consideration Document for the Chita Thermal Power Station Construction Plan to the Ministry of Economy, Trade, and Industry (METI) and local authorities. The plan involves decommissioning existing units 1 through 5 (while retaining unit 6) and constructing new units 7 and 8. The plan adopts the latest high-efficiency combined cycle power generation system (with gross thermal efficiency of approximately 63%).

JERA announced on 13 October 2020 that it had established "JERA Zero CO2 Emissions 2050". JERA has also formulated a roadmap for achieving the goal for its business in Japan and established new environmental targets to be achieved by 2030. According to the announcement, the main pillars of the roadmap are: shutdown of all inefficient coal power plants (supercritical or less) by 2030, and a gradual increase in the ratio of mixed combustion of fossil fuels, ammonia, and hydrogen at thermal power plants; development of renewable energy centred on offshore wind power projects; and further efficiency of LNG thermal power generation. In the end the company plans to reduce carbon emission intensity of thermal power plants by 20% based on the long-term energy supply-demand outlook for FY 2030 as set by the government.

New Otani Company and Tokyo Gas signed an agreement on carbon neutral city gas to be supplied to the co-generation system at the Hotel New Otani Tokyo starting on 1 October 2020.

EDF Trading announced on 14 October 2020 its entry into the Japanese power market, transacting Japanese power on the EEX platform in the preceding week.

On 20 October 2020, the LNG bunkering vessel (LBV) Kaguya, owned by Central LNG Shipping Japan Corporation, supplied LNG fuel to an NYK pure car and truck carrier (PCTC) "Sakura Leader" at the Berth of Shin Kurushima Toyohashi Shipbuilding - the first time in Japan for LNG fuel to be supplied to a vessel via Ship-to-Ship bunkering. The LNG fuel had been loaded at JERA's Kawagoe Thermal Power Station prior to this Ship-to-Ship bunkering. On 28 October, NYK took delivery of Sakura Leader, which was built at the Shin Kurushima Dockyard. The ship is the first large LNG-fuelled PCTC to be built in Japan.

Mitsubishi Corporation (MC) and Air Water Inc. announced that they had developed a compact LNG filling facility that can be used in space-limited logistics facilities.

FueLNG, a joint venture between Keppel Offshore & Marine and Shell Eastern Petroleum, named Singapore's first LNG bunkering vessel (LBV), *FueLNG Bellina*, which is scheduled to arrive in Singapore from the Keppel Nantong Shipyard in China by the end of 2020.

The Maritime and Port Authority of Singapore (MPA) has launched a request for

proposal (RFP) for parties seeking to supply LNG bunker in the Port of Singapore. MPA is expected to announce the successful award by February 2021.

Pavilion Energy and Gasum announced the signing of a memorandum of understanding (MOU) to develop a global LNG bunker supply network for their customers in Singapore and Northern Europe, including Amsterdam, Rotterdam and Antwerp.

Keppel Corporation announced on 26 October 2020 that Keppel Data Centres Holding Pte Ltd (Keppel DC), City Gas and City-OG Gas Energy Services (City-OG) had signed a Memorandum of Understanding (MOU) to explore using LNG and hydrogen to power Keppel DC's Floating Data Centre Park (FDCP) in Singapore, which is currently in its exploration phase.

JERA announced on 28 October 2020 that ExxonMobil Hai Phong Energy Pte Ltd (EMPHE), Hai Phong People's Committee and JERA had signed a Memorandum of Understanding (MOU) to work together on a potential integrated LNG to Power project in Hai Phong.

On 6 October 2020, Tokyo Gas signed a Joint Cooperation Agreement (JCA) with First Gen Corporation of the Philippines. The two companies will develop a floating storage and regasification unit (FSRU) project, with the aim of introducing LNG to the Philippines as early as in the second half of 2022. First Gen said on 30 October that its wholly-owned subsidiary FGEN LNG Corporation was eyeing the development of small-scale LNG (ssLNG) solutions at the First Philippine Industrial Park.

New Fortress Energy announced on 15 October 2020 that it had signed a Memorandum of Understanding (MOU) with the Philippine National Oil Company (PNOC) to develop power and LNG infrastructure into the Philippine.

PipeChina (National Petroleum and Natural Gas Pipeline Network Group) published on 10 October 2020 available capacity and prices for third parties to access its network of pipelines and LNG facilities. PipeChina is offering regasification capacity at six LNG terminals in November and December 2020.

Total announced on 20 October 2020 that it delivered its first shipment of carbon neutral LNG to the Chinese National Offshore Oil Corporation (CNOOC) on 29 September. The cargo was from the Ichthys plant in Australia and was delivered to the Dapeng terminal, China.

CNOOC announced on 2 November 2020 that Liuhua 29-1 gas field had commenced production. CNOOC has a 25% working interest in Liuhua 29-1 gas field and acts as the operator in shallow water, while Husky Oil China holds the remaining 75% working interest and acts as the operator in deep water.

Shanghai Petroleum and Natural Gas Exchange (SHPGX) on 2 November 2020

executed its first international LNG tender transaction. CNOOC will purchase 65,000 tonnes of LNG to be delivered in March 2021 from Aramco Trading Singapore.

Six people were killed and three were injured at the Beihai LNG terminal in Guangxi, China following a fire incident on 2 November 2020.

Rolls-Royce said on 6 October 2020 that it had signed a contract with Dhamra LNG Terminal (DLTPL) of India for delivery of a 29 MW gas-based power plant for an LNG terminal on the eastern coast of Odisha in India.

Pakistan LNG said on 8 October 2020 that the company and Karachi Electric had signed Heads of Agreement (HOA) for supply of RLNG to 900 MW BQPS-III power plant. The power plant will have 2 units. Unit-1 and Unit-2 are expected to commission in March 2021 and November 2021, respectively.

Australia's Department of Industry, Science, Energy and Resources announced on 27 October 2020 that the government was examining options for a prospective national gas reservation scheme as part of its plan to make energy affordable for families and businesses and supporting jobs as part of Australia's recovery from the COVID-19 recession.

Cooper Energy announced on 12 October 2020 it had become Australia's first carbon-neutral domestic gas producer by fully offsetting its FY20 emissions.

Developers of the Port Kembla Gas Terminal Project, Australian Industrial Energy Pty Ltd (AIE), announced on 20 October 2020 that Squadron Energy had acquired JERA's 19.9% and Marubeni's 30.1% interest in the project moving to 100% ownership of AIE.

Santos announced on 22 October 2020 that it had injected 100 tonnes of carbon dioxide into depleted gas reservoirs in the Strzelecki field in the Cooper Basin as part of the final field trial for the Moomba Carbon Capture and Storage (CCS) Project. Santos will finalise technical and commercial arrangements with the aim of having the 1.7 million tonne per year project ready for a final investment decision (FID) by the end of 2020.

The Australian government announced on 23 October 2020 that it had granted the proposed Asian Renewable Energy Hub (AREH) in the Pilbara region Major Project Status. AREH would be the "world's largest" 26 GW green power, hydrogen, ammonia and methanol production facility. The project is to produce almost 10 million tonnes per year of zero-emissions fuels for export.

Shell revealed on 15 October 2020 that it did not expect full production to resume before year end from its Prelude FLNG facility. Shell recognised impairment losses of USD 1,636 million during the third quarter of 2020, mainly relate to Prelude floating LNG in Australia (USD 1,327 million pre-tax).

[North America]

The U.S. Department of Energy (DOE) announced in late October 2020 that it had extended the terms of ten long-term LNG export authorizations through 2050. The authorization holders are: Venture Global Calcasieu Pass, LLC; Venture Global Plaquemines LNG, LLC; Rio Grande LNG, LLC; Dominion Energy Cove Point LNG, LP; Corpus Christi Liquefaction Stage III, LLC; and the Freeport entities -- Freeport LNG Expansion, L.P., FLNG Liquefaction, LLC, FLNG Liquefaction 2, LLC, FLNG Liquefaction 3, LLC, and FLNG Liquefaction 4, LLC, as well as Cheniere Energy's Sabine Pass and Corpus Christi LNG export terminals, in Louisiana and Texas, respectively, and Sempra Energy's Port Arthur LNG project proposed in Texas.

According to DOE's October Natural Gas Monthly, in August 2020, for the fourth consecutive month, dry natural gas production in the United States decreased year over year for the month. The preliminary level for dry natural gas production in August was 2,801 billion cubic feet (Bcf), or 90.4 Bcf/d, 4.5 Bcf/d (-4.7%) lower than the August 2019 level. LNG exports in August 2020 were down 20% compared with August 2019, at 2.29 million tonnes, based on the data from DOE's Office of Fossil Energy (FE) on 16 October.

Cheniere Energy, Inc. reported net loss of USD 463 million for the third quarter of 2020. During the three and nine months until September, the company recognized USD 171 million and USD 932 million, respectively, in revenues associated with LNG cargoes for which customers had notified the company that they would not take delivery. Corpus Christi Train 3 and Sabine Pass Train 6 are expected to be substantially completed in 1Q 2021 and 2H 2022.

NextDecade Corporation announced on 6 October 2020 that the company had developed proprietary processes using proven technology to reduce carbon dioxide equivalent (CO₂e) emissions at its proposed Rio Grande LNG facility by approximately 90%.

Delfin Midstream announced on 11 October 2020 the completion of FEED for the Newbuild FLNG Vessel of 3.5 million tonne per year capacity for the Delfin LNG Project in cooperation with Samsung Heavy Industries and Black & Veatch. The company said it could execute the project for a total capital cost of around USD 550 /tonne per year. The company also said the Delfin Newbuild FLNG Vessel design uses the latest gas turbine technology, optimizations of the Black & Veatch's patented PRICO® liquefaction technology, direct air cooling and waste-heat recovery to achieve maximum fuel efficiency and minimal (GHG) emissions.

Pilot LNG announced on 20 October 2020 that it had executed a Heads of Agreement (HOA) with GAC Bunker Fuels (GAC), which outlines the terms of a partnership for the supply of LNG as a marine fuel from its proposed Galveston LNG Bunker Port

terminal project, which will be the first dedicated LNG bunker terminal in the region.

Eagle LNG Partners announced on 26 October 2020 that it had entered into a long-term agreement with Barbuda Ocean Club in Barbuda, West Indies, to transition to natural gas for power generation.

Wärtsilä announced on 19 October 2020 that it would supply its advanced Energy Storage System (ESS) to be retrofitted on four Harvey Energy class LNG-fuelled Platform Supply Vessels (PSVs).

EQT Corporation announced on 27 October 2020 that it had entered into a purchase and sale agreement with Chevron under which EQT will acquire Chevron's upstream and midstream assets in the Appalachian Basin. The transaction is expected to close late in the fourth quarter of 2020.

Gitga'at Waiward Industrial announced on 23 October 2020 that it had been awarded a contract to supply stick built structural steel to JGC Fluor, the engineering, procurement and construction (EPC) contractor for the LNG Canada Project. Gitga'at Waiward Industrial is a joint venture partnership between Gitga'at First Nation and Waiward Industrial that was formed in November 2019, and provides a comprehensive range of construction, maintenance, fabrication and engineering services. Deliveries are expected to commence in early 2021 and continue through to December 2022.

B.C. Environmental Assessment Office announced on 26 October 2020 that Woodfibre LNG Limited had received a 5-year extension for the deadline in the certificate to substantially start the Woodfibre LNG Project. The new deadline is 26 October 2025.

On 22 October 2020, Naturgy and the Puerto Rico Electric Power Authority (PREPA) agreed to extend the contract for the long-term supply of LNG to Puerto Rico until 2032. It covers an annual volume of 2 bcm and could reach 3 bcm depending on the country's needs, and the price will be completely indexed to the Henry Hub. The contract to supply LNG to PREPA was set to expire in October 2020. It had an annual volume of 1.5 bcm and the price indexation was linked to oil (50%) and the Henry Hub (50%).

[Middle East]

bp announced on 12 October 2020 that it had started production from the Ghazeer field in the Oman ahead of schedule. It also said that flaring reduction techniques had helped to drive down emissions during well testing.

Chevron Corporation announced on Monday 5 October 2020 that its acquisition of Noble Energy had been completed following approval by Noble Energy shareholders.

[Africa]

Algeria's Sonatrach and Spain's Naturgy signed amendments to the gas sales contracts between the two companies. The two companies are shareholders of the company Medgaz which operates the gas pipeline connecting Algeria to Spain, respectively at 51% and 49%.

bp announced on 26 October 2020 the start of gas production from its latest development offshore Egypt - the Qattameya gas field in the North Damietta offshore concession. Through bp's joint venture, Pharaonic Petroleum Company (PhPC), the field, which is expected to produce up to 50 million cubic feet of gas per day, has been developed through a one-well subsea development and tie-back to existing infrastructure.

Golar LNG Limited announced on 1 October 2020 that Gimi MS Corporation, a subsidiary of Golar, had confirmed a revised project schedule with BP Mauritania Investments Limited for the Greater Tortue Ahmeyim project. The revised project schedule will result in the target connection date for the converted floating LNG vessel Gimi, previously scheduled for 2022, being extended by 11 months.

DNG Energy announced on 12 October 2020 that it had received final authorisation from the Transnet National Port Authority (TNPA) to begin LNG bunkering operations in the Port of Coega, in the Eastern Cape, South Africa.

QP (Qatar Petroleum) announced on 28 October 2020 a new gas/condensate discovery in the Luiperd prospect, located in Block 11B/12B, in the Outeniqua Basin, 175 km off the southern coast of South Africa. This is the second significant discovery in the block. It is operated by Total with a 45% working interest, alongside QP (25%), CNR International (20%) and Main Street (10%).

[Europe / Russia]

The European Commission presented on 14 October 2020 an EU strategy to reduce methane emissions. The strategy focuses both on reducing methane emissions in the EU and addressing methane emissions associated with supply chains linked to the EU. While the strategy encourages voluntary and business-led initiatives, EU legislative proposals are planned for 2021. The Commission will also consider legislation on eliminating routine venting and flaring in the energy sector as well as methane emission reduction targets, standards or other incentives for fossil energy consumed and imported in the EU in the absence of significant commitments to reduce methane emissions by international partners.

National Grid's Grain LNG and Qatar Terminal Limited (QTL), a subsidiary of Qatar Petroleum, on 13 October 2020 announced a 25-year agreement that will provide the Qatari company with storage and redelivery capacity at Grain LNG from the middle of 2025. The

agreement marks the conclusion of Grain LNG's competitive "Open Season" process, kicked off in November 2019.

NYK announced on 23 October 2020 that it had signed a Sales and Purchase Agreement with Total, acquiring all the French company's shares in the ship management company, Gazocean, based in Marseille, France, and responsible for the management of six LNG carriers. Before the purchase, NYK held 20% of Gazocean shares and Total held 80%.

Total announced on 28 October 2020 that it was chartering four Aframax-type vessels equipped with LNG propulsion. These vessels with a capacity of 110,000 tonnes of crude oil or refined products each, will be delivered in 2023. The first two vessels will be chartered from shipowner Hafnia, and the remaining two from Viken Shipping. The supply of LNG for these four LNG-powered vessels will be provided by Total Marine Fuels Global Solutions.

HAM Group announced on 7 October 2020 that anticipating lack of tank loading capacity during the winter period at the Enagás' plant in Barcelona and the Bahía Bizkaia's plant, HAM Group had signed an LNG contract at the Marseille Terminal, in order to avoid the shortage of its customers in Spain.

Wärtsilä announced on 8 October 2020 that it had been awarded a contract to construct a plant to liquefy gas from the grid to produce carbon-neutral LNG. It will have a capacity of approximately 100,000 tonnes per year and located in Cologne, Germany. The feedstock for bioLNG is based on biological waste material e.g. liquid manure and food waste. The feedstock is fed to an anaerobic digestion reactor that produces biogas, which is then upgraded to biomethane and injected into the natural gas grid. The plant is expected to be operational by autumn 2022.

Equinor revealed on 26 October 2020 that surveys of the damage after the fire at Hammerfest LNG on 28 September indicated that the LNG plant would be closed for until 1 October 2021 for repairs.

Italy's Edison and Spain's Enagás announced on 23 October 2020 that Edison and Scale Gas Solutions, a subsidiary of Enagás, finalized the transaction that makes the Spanish Company a new shareholder of Depositi Italiani GNL (DIG). The two companies agreed to cooperate in the development of Small-Scale LNG in the Mediterranean promoting the establishment of a strong LNG supply chain from Enagás' Mediterranean LNG terminals to Edison customers. Scale Gas Solutions acquires from Edison 19% of the shares of Depositi Italiani GNL, the newco created in 2018 between Edison and PIR for the development and management of the first coastal deposit in Italy. After the transaction, the shareholding structure of Depositi Italiani GNL will be: 51% PIR, 30% Edison and 19% Scale Gas Solutions. The construction of the Ravenna deposit has exceeded 70%, allowing the confirmation of a

commercial operation date in October 2021. The Ravenna depot will have a storage capacity of 20,000 cubic meters of LNG and an annual handling capacity of over 1 million cubic meters of liquid gas.

OLT Offshore LNG Toscana announced on 23 October 2020 that the Ministry of Economic Development had issued the decree authorizing OLT Offshore LNG Toscana, the company controlled by Snam and First Sentier Investors that manages the "FSRU Toscana" terminal off the Tuscan coast between Livorno and Pisa, to provide the discharge of LNG in to Small Scale LNG carriers.

Costa Cruises announced on 26 October 2020 that the first LNG bunkering operation in Italy, for Costa Smeralda, was completed with support by authorities and Shell.

PGNiG (Polish Oil and Gas Company) announced that its trading arm and Ørsted had signed a multi-year contract for the sale and purchase of 70 TWh (6.4 bcm) of natural gas to be supplied between 1 January 2023 and 1 October 2028.

Turkey plans to expand its LNG storage capacity by adding a third Floating Storage Regasification Unit (FSRU) in Saros Bay, north of the Gallipoli Peninsula in northwest Turkey by 2021, Turkey's Deputy Energy and Natural Resources Minister announced on Thursday 8 October 2020.

Russia's Gazprom announced on 27 October 2020 commissioning of two new natural gas refuelling stations in Moscow. The total number of Gazprom's gas refuelling facilities in Moscow and the adjacent territory has increased to seven. The company said that two of the CNG filling stations with the annual design capacity of 29.8 million cubic meters each are the largest in Europe. Mosgortans (Moscow City Transport Authority) and Ecotechprom (household waste management) will be the main consumers of natural gas.

Gazprom announced on 8 October that a new gas deposit was discovered at the Leningradskoye field of the Yamal gas production center. This marks the fourth major discovery made by Gazprom on the shelf of the Yamal Peninsula in the Kara Sea over the last two years.

The Department of State (United States) announced on 20 October 2020 that it had broadened the scope of sanctions targeting the Nord Stream 2 pipeline project.

Mitsui O.S.K. Lines (MOL) announced on 21 October 2020 that on the preceding day, a naming ceremony for an LNG carrier, jointly ordered by MOL and China COSCO Shipping, was held at Hudong-Zhonghua Shipbuilding (Hudong). The vessel is the last of four newbuilding conventional LNG Carriers for the Yamal LNG Project.

MOL announced on 2 November that charter agreements were signed for three icebreaking LNG carriers with ARCTIC LNG 2, the largest shareholder of which is NOVATEK, on 28 October. The vessels will be built by Daewoo Shipbuilding & Marine Engineering

(DSME) and are scheduled for delivery in 2023. The vessels will mainly transport LNG from an LNG loading plant on the Gydan Peninsula in the Russian Arctic to the floating LNG storage units (FSU) to be installed at the transshipment terminals in Kamchatka (eastbound) and Murmansk (westbound) via the Northern Sea route. Compared with MOL's previous icebreaking LNG carriers, which can only sail eastbound in the Northern Sea Route during mostly summer and autumn period of time when the ice is thin, the new vessels will have a narrower width, hull form optimized for ice breaking, and an increased propulsion engine output which will enable the vessels to sail east via the Northern Sea Route all year round.

Gazprom revealed on 28 October 2020 that the expansion of production capacity was progressing at the Chayandinskoye field in Yakutia and production drilling was underway at the Kovyktinskoye field in Irkutsk. Commissioning activities are underway at the first two production trains of the Amur Gas Processing Plant.

[South America]

The Panama Canal Authority announced on 8 October 2020 the operation performance of the canal for the year from October 2019 to September 2020. Transit volumes of LNG and LPG increased to 14.35 million tonnes from 13.07 million tonnes and to 24.28 million tonnes from 19.66 million tonnes, respectively.

EXMAR announced on 19 October 2020 that it had reached a settlement agreement with YPF over the dispute under the TANGO FLNG Agreements (as announced on 25 June 2020). A settlement amount of USD 150 million will be paid by YPF to EXMAR in consideration of the early termination of the agreements and withdrawing the arbitration proceedings.

Golar LNG Limited announced on 12 October 2020 that Hygo and Norsk Hydro had mutually agreed to terminate the existing MOU between the parties dated 22 July 2020 to supply LNG to the Alunorte alumina refinery in Brazil.

HAM Group announced on 21 October 2020 that HAM Chile, a subsidiary of HAM Group, had been chosen by Lipigas Companies for the design, construction and commissioning of Chile's first LNG gas station, to be located at the facilities of Transportes San Gabriel, Linares, Maule Region, very close to the Ruta Cinco Sur (Pan-American Highway in Chile).

Reference: Company announcements, Reuters, Cedigaz News Report.

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