

LNG Review October 2022
- Recent issues and events -
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Introduction

Qatar has completed selection processes of international partners to participate in the two expansion LNG projects. 25% of NFE and NFS (North Field East and South) projects are now owned by its European and American partners.

East Africa is about to ship its first LNG into the global LNG market. Partners have confirmed that LNG production has begun at the Coral Sul Floating LNG project in Mozambique.

Japan's average LNG import price, measured in the Japanese currency, was JPY 164,922 per tonne in September 2022, the highest ever again after the previous high in August. It was the fifth time to renew the highest in 2022 alone. The price measured in the U.S. dollars in September was also the highest in the history approaching USD 23 per million Btu, surpassing the previous high in August.

During the first nine months of 2022, China imported 47 million tonnes of LNG, a 20% reduction from one year earlier. Japan's import of 55 million tonnes during the same period was also down by 3% from 2021, but was larger than China's.

The European Union and the United Kingdom imported 81 million tonnes of LNG during the first nine months of 2022, a 63% or 31 million tonnes growth from the same period of 2021.

As for European gas prices, TTF contract for November 2022 fell 34% from €169.912 / MWh (USD 48.62 / million Btu) on 3 October to €112.244 / MWh (USD 32.73 / MBtu) on 28 October. Prices in the European gas markets, still very expensive compared to one year earlier, have fallen notably during the month due to mild weather and ample wind power generation reducing gas demand for power generation.

* 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]

The Japan Bank for International Cooperation (JBIC) announced on 6 and 31 October 2022 that the bank had signed loan agreement with JERA for JPY 130 billion and JOY 100 billion, respectively. These loans would be co-financed with private financial institutions, it said. The loan is to help JERA fund LNG purchases.

Japan's METI (Ministry of Economy, Trade and Industry) announced on 14 October 2022 that the Cabinet agreed on the draft amendments to the Gas Industry Act and the Act on the Japan Oil, Gas and Metals National Corporation to be submitted to the 210th session of the Diet. The proposed amendments would authorise the Minister of Economy, Trade and Industry to request JOGMEC (Japan Oil, Gas and Metals National Corporation) to procure LNG. The proposed amendments would also authorise the Minister to order or encourage certain large-volume gas customers to remit gas usages.

The Kansai Electric Power Co., Inc. announced on 13 October 2022 that the company and Shell had signed a Memorandum of Understanding (MoU) on business opportunities in liquid hydrogen supply chains.

Mitsui O.S.K. Lines, Ltd. (MOL) announced on 20 October 2022 that it signed a multi-year contract to charter a newbuild LNG Carrier with TotalEnergies Gas & Power Limited on 26 September. The vessel being built by Daewoo Shipbuilding & Marine Engineering (DSME) will be fitted with the modern ME-GA engine.

Japan's Ministry of Economy, Trade and Industry (METI) and the Ministry of Trade and Industry of Singapore signed an MoC on LNG cooperation and energy transitions. The MoC aims to promote cooperation in the LNG sector and energy transitions, including joint investment and cooperation in times of crisis, and to link the knowledge gained to upstream investment and a stable supply of hydrogen and ammonia.

According to a LinkedIn post by Singapore's Sembcorp on Tuesday 11 October 2022, the company had signed an LNG supply agreement with TotalEnergies to import an LNG supply strip for five years starting from 2025.

Pavilion Energy and Mitsui O.S.K Lines (MOL) announced that they held a ship naming ceremony at Sembcorp Marine's Tuas Boulevard Yard on 4 October 2022. The Singapore-flagged vessel was named Brassavola, after a species of orchid (orchids being the national flower of Singapore).

Pavilion Energy announced on 3 October 2022 that Pavilion Energy and DNV had developed a fit-for-purpose LNG bunker digital solution for employment in the Port of Singapore, based on a tailored digital bunkering platform 'FuelBoss' to meet local requirements.

According to Pakistan LNG Limited's (PLL) tender result published on Monday 3

October 2022, it did not receive any bid in two tenders. PLL had originally floated the tender for 72 cargos - one cargo a month from 2023 to 2028.

The Australian Government announced on 23 October 2022 that the country had joined the Global Methane Pledge.

Tokyo Gas Co., Ltd. announced on 7 October 2022 that it had entered into an agreement to transfer five subsidiaries (stakes in four LNG projects) of its Australian subsidiary, Tokyo Gas Australia Pty Ltd (TGAU), to MidOcean Energy Holdings Pty Ltd (MidOcean), a controlled company of EIG Global Energy Partners, LLC (EIG). Under the Compass Action plan, which is a concrete path for realizing Tokyo Gas' management vision, Compass 2030, the company has been reviewing its asset portfolio in order to allocate resources to growth areas. The transfer is based on this strategy.

Woodside Energy and the Japan Bank for International Cooperation (JBIC) announced on 1 November 2022 that they had signed a memorandum of understanding (MOU) aimed at securing a stable supply of energy for Japan and to assist in achieving its decarbonisation goals.

Australia's Santos and the Japan Bank for International Cooperation (JBIC) announced on 5 October 2022 that they had signed a Memorandum of Understanding (MOU) to promote the securing of stable energy and the progression of decarbonisation goals.

Malaysia's PETRONAS announced on 8 October 2022 that it had declared Force Majeure (FM) on gas supply to MLNG Dua due to a pipeline leak caused by soil movement at the vicinity of KP201, Sabah-Sarawak Gas Pipeline (SSGP) that occurred on 21 September 2022. This has impacted the supply of gas to MLNG Dua's production facility at PETRONAS LNG Complex (PLC) in Bintulu, Sarawak. PETRONAS has clarified that the FM affects the supply of gas to MLNG Dua's production facility only, while the other LNG production facilities within the PLC continue to operate as planned. PETRONAS is mindful that this incident has impacted its delivery commitments to some of its contracted LNG buyers and it is in discussions to identify suitable mitigation efforts. PETRONAS is conducting a comprehensive evaluation of the SSGP to ensure the integrity and safety of the pipeline.

Malaysia's PETRONAS announced on 13 October 2022 that it had signed a Production Sharing Contract (PSC) with TotalEnergies EP Malaysia (TE), PETRONAS Carigali Sdn Bhd (PCSB), Sabah Shell Petroleum Company Limited (SSPC) and Shell Sabah Selatan Sdn Bhd (SSS) for Block 2K, an ultra-deepwater block located off the coast of Sabah. TE will be the operator with a 34.9% interest. PCSB holds a 40% interest while the remaining 25.1% is equally split between the other two partners, SSPC and SSS.

[North America]

Cheniere Energy, Inc announced on 19 October 2022 that it had joined the Oil and Gas Methane Partnership (OGMP) 2.0, the United Nations Environment Programme's (UNEP) oil and gas methane emissions reporting and mitigation initiative. OGMP 2.0 is a comprehensive, measurement-based reporting framework intended to improve the accuracy and transparency of methane emissions reporting in the oil and gas sector.

Sempra Infrastructure announced on 20 October 2022 that Port Arthur LNG and Bechtel Energy had amended and restated the fixed-price engineering, procurement and construction (EPC) contract, for the Phase 1 liquefaction project under development in Jefferson County, Texas. The amended contract includes an updated price of approximately USD 10.5 billion, according to the announcement. The Phase 1 project is expected to include two liquefaction trains and associated facilities capable of producing up to 13.5 million tonnes per year of LNG. A similarly sized Phase 2 project is also under marketing and development. Earlier in 2022, Sempra Infrastructure announced the substantial completion of marketing for Phase 1 with the signing of non-binding agreements with the Polish Oil & Gas Company (PGNiG), RWE Supply & Trading, INEOS Energy Trading Ltd., and ConocoPhillips.

QatarEnergy announced on 26 October 2022 that affiliates of QatarEnergy and ExxonMobil had agreed to independently offtake and market their respective proportionate equity shares of LNG produced by the Golden Pass LNG Export Project located in Sabine Pass, Texas in the United States of America. QatarEnergy Trading LLC will offtake, transport, and trade 70% of the LNG produced by Golden Pass LNG. The construction of Golden Pass LNG, which has a total production capacity in excess of 18 million tonnes of LNG per year, is underway with first LNG production expected by the end of 2024. Ocean LNG Limited, a joint venture established in 2016 between affiliates of QatarEnergy and ExxonMobil for the purpose of offtaking and marketing the entire production of Golden Pass LNG, has ceased operations, and will be wound down.

Venture Global LNG and EnBW announced on 6 October 2022 the expansion of their existing LNG partnership to 2 million tonnes per year. Under the 20-year Sales and Purchase Agreements (SPAs) signed in June 2022, EnBW has increased the quantity of its long-term LNG offtake from Venture Global by an additional 0.5 million tonnes per year from Plaquemines and CP2 LNG.

Sembcorp Marine announced on 20 October 2022 that its subsidiary Sembcorp Marine Rigs & Floaters Pte Ltd entered into Master Service Agreements with New Fortress Energy (NFE) affiliates for the engineering and conversion of two Sevan cylindrical drilling vessels to Floating LNG (FLNG) liquefaction facilities. The hull conversion and fabrication of topsides for the first FLNG liquefaction facility is scheduled for delivery in the first half of

2024. The two FLNG liquefaction units will host the NFE-designed Fast LNG liquefaction production facility with a capacity of approximately 1.4 million tonnes per year. LNG produced will be stored in a separate LNG tanker moored near the FLNG liquefaction facility.

bp announced on 17 October 2022 that it had struck a deal to acquire Archaea in a deal worth USD 4.1 billion. bp said the deal would increase its biogas supply in the United States volumes by 50%. bp said Archaea's production and pipeline of projects - coupled with bp's exiting portfolio - had the potential to take the company's global biogas supply volumes to 70,000 boe/d by the start of the next decade.

Australia's Woodside Energy announced on 17 October 2022 that it had awarded Nel Hydrogen Electrolyser AS, a subsidiary of Nel ASA, a contract for the alkaline electrolyser equipment for H₂OK, its proposed hydrogen project in Ardmore, Oklahoma. The alkaline electrolyser equipment would support phase 1 of the H₂OK project, designed to produce 90 tonnes per day (tpd). The project will produce liquid hydrogen for hydrogen fuel cell-powered commercial and heavy transport vehicles. Woodside is also working on two proposed hydrogen projects in Australia: H₂Perth and H₂TAS.

Siemens Energy announced on 20 October 2022 that it had been selected by Northeast Energy Center (NEC) and Chart Energy & Chemicals to supply a gas/electric hybrid drive system for NEC's LNG plant being built in Charlton, Massachusetts.

New Fortress Energy Inc. (NFE) announced on 28 October 2022 that it had finalized its agreements with Comisión Federal de Electricidad (CFE). The final agreements, which were originally announced on 5 July and are expected to be executed at a ceremony planned for 3 November in Mexico City, involve (i) expanding and extending NFE's supply of natural gas to multiple CFE power generation facilities in Baja California Sur, (ii) selling NFE's 135 MW La Paz power plant to CFE, and (iii) creating a new FLNG hub off the coast of Altamira, Tamaulipas, with CFE supplying requisite feedgas to multiple NFE FLNG units using CFE's existing and underutilized pipeline capacity. NFE will deploy multiple FLNG units of 1.4 million tonnes per year each that utilize CFE's existing firm pipeline transportation capacity on TC Energy's Sur de Texas-Tuxpan Pipeline to deliver feedgas volumes to NFE. NFE's first FLNG unit, which is under construction at the Kiewit Offshore Services shipyard near Corpus Christi, Texas, is currently expected to achieve mechanical completion in March 2023.

[Middle East]

Abu Dhabi National Oil Company (ADNOC) announced on 31 October 2022 that ADNOC and GAIL (India) Limited signed a Memorandum of Understanding to explore collaboration opportunities in LNG supply and decarbonisation. The agreement also includes potential optimization of LNG trading activities, the review of joint equity investments in

renewables and the monitoring of greenhouse gasses for LNG cargoes, to support low carbon LNG supplies.

QatarEnergy announced on 30 October 2022 that it had selected ConocoPhillips as its third and final international partner in the North Field South (NFS) expansion project, which comprises two LNG mega trains with a combined capacity of 16 million tonnes per year. ConocoPhillips will have an effective net participating interest of 6.25% in the NFS project, out of a 25% interest available for international partners. QatarEnergy will hold the remaining 75% interest.

QatarEnergy announced on 23 October 2022 that it had selected Shell as its second international partner in the North Field South (NFS) expansion project, which comprises 2 LNG mega trains that will have a combined capacity of 16 million tonnes per year. Shell will have an effective net participating interest of 9.375% in the NFS project, out of a 25% interest available for international partners. QatarEnergy will hold the remaining 75% interest.

Saipem announced on 19 October 2022 that it had been awarded a contract by Qatargas for the North Field Production Sustainability Offshore Compression Complexes Project - EPC 2 located offshore the northeast coast of Qatar.

QatarEnergy and TotalEnergies announced on 18 October 2022 that Al-Kharsaah Solar PV Power Plant (KSPP) with a capacity of 800 MW had been inaugurated. The plant is owned by a joint venture between affiliates of QatarEnergy Renewable Solutions (60%), Marubeni (20.4%) and TotalEnergies (19.6%). KSPP started supplying electrical power to Qatar's electricity grid in June 2022, marking the startup of the 400 MW first phase. Full capacity was reached by the end of the second phase.

[Africa]

ENI announced on 10 October 2022 start of production from two gas fields related to the Berkine Sud contract in Algeria, just 6 months after the contract was awarded through an accelerated development (fast track). The production of the Berkine South, which is the first contract to be signed under the new Algerian hydrocarbon law 19-13, is operated by Eni and Sonatrach, and currently has a production capacity 1 mcm per day of gas, and approximately 4,000 barrels per day of associated liquids. This capacity is expected to increase to around 2 mcm / d by the end of 2022.

ENI confirmed in its Q3 2022 Earnings Call on 28 October 2022 that the Coral project in Mozambique had produced the first LNG and was completing the ramp-up to achieve the first cargo.

[Europe / Russia]

Intercontinental Exchange (ICE) announced on 27 October 2022 plans to launch two LNG futures contracts for North-West Europe and South-West Europe. The contracts will be cash settled based on Spark Commodities' price assessments for LNG cargos. The contracts are due to launch on 5 December 2022. ICE says that it is ready to assist with developing an EU futures market based on the complementary LNG benchmark to be developed by the EU Agency for the Cooperation of Energy Regulators (ACER).

European Council agreed on 21 October 2022 on mandatory joint purchasing of gas and demand aggregation for 15% storage filling, a new complementary benchmark that more accurately reflects conditions on the gas market to be established by early 2023, a temporary dynamic price corridor on natural gas transactions, and a temporary EU framework to cap the price of gas in electricity generation.

Centrica announced on 28 October 2022 the reopening of the Rough gas storage facility. Rough is operating at around 20% of its previous capacity in winter 2022/2023, adding 50% to the United Kingdom's gas storage volume.

Titan announced on 13 October 2022 that it would scale up Liquefied Biomethane (LBM, also known as bio-LNG) production in the Port of Amsterdam together with BioValue as biogas supplier. Linde has been contracted to perform the basic engineering. Titan announced its LBM production project for 200,000 tonnes per year. Titan will build and operate the LBM plant at its strategic location in the Port of Amsterdam allowing supply to ships and trucks. BioValue will construct a new biogas plant, adjacent to the LBM plant. The remaining biogas will be sourced from other production installations throughout Europe that are connected to the existing gas grid.

France's gas network operator GRTgaz said on 13 October 2022 that France had for the first time started sending natural gas to Germany. GRTgaz said the gas pipeline connecting both countries at the French border village of Obergailbach had begun delivering an initial daily capacity of 31 GWh. The amount is expected to eventually increase to a daily maximum of 100 GWh (2.41 million tonnes per year).

Lithania's KN (Klaipėdos Nafta AB) announced on 20 October 2022 that it had been selected by Germany's Uniper to provide the operational services of the floating LNG terminal under construction in Wilhelmshaven on the North Sea coast. The FSRU will be supplied and operated by Höegh LNG. KN will provide operational services until preliminary date of 31 March 2024.

German LNG Terminal GmbH (GLNG) announced on 11 October 2022 that it had achieved key milestones in the development of the onshore LNG import terminal in Brunsbüttel, Germany. GLNG has executed the Engineering Procurement and Construction

(EPC) contract with CS Gas North S.A. - a joint venture between COBRA Instalaciones y Servicios S.A. and SENER Ingeniería y sistemas S.A. GLNG has also entered into agreements with ConocoPhillips, INEOS and RWE Supply & Trading (as foundation customers) for long-term regasification capacity in the terminal. The terminal will have an annual throughput capacity of 8 bcm. The terminal is expected to be operational in 2026.

The European Commission announced on 11 October 2022 that it had approved, under the EU Merger Regulation, the acquisition of joint control of German LNG Terminal GmbH ('GLNG') by KfW, both of Germany, and Nederlandse Gasunie of the Netherlands. GLNG will build, own, and operate an LNG regasification facility in Brunsbüttel, Germany.

Tree Energy Solutions (TES) announced on 5 October 2022 that the company and Fortescue Future Industries (FFI) had agreed to develop a large-scale green hydrogen integrated project. The first phase is to develop and invest in the supply of 300,000 tonnes of green hydrogen. FFI and TES have agreed terms for FFI to make an equity investment of €30 million to become a strategic shareholder in TES and to invest €100 million for a significant stake in the construction of the TES import terminal in Wilhelmshaven, Germany. First deliveries of green hydrogen into the terminal are expected to take place in 2026. FFI joins strategic investors in TES, including E.ON, HSBC, UniCredit, and Zodiac Maritime.

Denmark's gas system operator Energinet said on 1 November 2022 that the new Baltic Pipe pipeline between Norway and Poland received its first direct deliveries of Norwegian gas after a Danish terminal started operations following delays.

Finland's Hamina LNG Oy announced on 6 October 2022 that commissioning of its terminal had been completed and Hamina LNG had started to provide services. Hamina LNG provides LNG storage services with a storage capacity of 30,000 m³ and regasification and injection services into the Finnish gas transmission network with a daily capacity of 4,800 MWh. Other services include LNG truck loading, vessel unloading and loading, and vessel bunkering. The Hamina terminal is the first LNG import terminal in Finland connected to the transmission network.

According to Spain's gas network operator Enagás, it may limit the number of cargoes its LNG system handles until the first week of November 2022 as a "significant" reduction in industrial demand since August and high storage levels left it little room to absorb excess imports.

ENI announced on 11 October 2022 that it had begun providing additional volumes of LNG to the regasification terminal of Panigaglia (La Spezia) ahead of the 2022-2023 winter. The first cargo was delivered on Sunday with supplies coming from Angola, reloaded on smaller ships at Spanish terminals for them to be compatible with the terminal in Liguria. Further LNG deliveries from Egypt and Algeria are also expected in October.

Bulgari's Bulgargaz announced on 10 October 2022 that it had secured sufficient LNG volumes for November through a tender procedure. Offers were received from 8 companies from Europe, Asia and the United States. Two suppliers were selected with secured slots for regasification and storage at the Revitusa terminal - Mytilineos SA and DEPA Commercial SA.

Höegh LNG Holdings Ltd. announced on 5 October 2022 that AB Klaipėdos Nafta (KN) had notified Höegh LNG that KN exercises its option to acquire the floating storage regasification unit (FSRU) Independence. The transfer of ownership is expected to occur in December 2024.

Gazprom revealed on 1 November 2022 its gas production and supply result for the first ten months of the year. According to preliminary data, Gazprom produced 344 bcm of gas, 18.6% (78.8 bcm) less than one year ago. Exports to non-CIS countries amounted to 91.2 bcm, 42.6% (67.6 bcm) less than in the same period of 2021.

Technip Energies said on 20 October 2022 in its nine months 2022 Results Release that its exit from Arctic LNG 2 was progressing and all operational personnel had been demobilized from the project. The company has signed an Exit Framework Agreement with its customer. The company anticipates completing the process within the first half of 2023.

Russia's President issued a decree on 7 October 2022 that would establish a new operator for the Sakhalin-1 project.

[South America]

QatarEnergy announced on 31 October 2022 an oil discovery in the 4-BRSA-1386D-RJS well in Brazil's Sépia oil field, which is located in the prolific Santos Basin in water depths of about 2,000 meters off the coast of Rio de Janeiro. QatarEnergy acquired a working interest in the Sépia Co-Participated Area in December 2021. The Area is operated by Petrobras (with a participating interest of about 52%) in partnership with TotalEnergies (19.2%), QatarEnergy (14.4%) and Petronas Petr leo Brasil Ltda (14.4%).

Reference: Company announcements, Cedigaz News Report.

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