

LNG Review April 2022 - Recent issues and events -

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Introduction

During the first quarter of 2022, the world traded 100 million tonnes of LNG, a 6%, or 6 million tonne increase year-on-year. The trade-flow shifted significantly toward Europe, which, in addition to the European Union (EU), including the United Kingdom and Turkey, imported nearly one-third of the total LNG production in the world during the first quarter of 2022. The EU imported 21 million tonnes, increasing by 70% from one year earlier.

On the other hand, the Asia Pacific region imported 67 million tonnes, 7% less than it did in the same period of 2021. Japan imported 20 million tonnes during the first quarter of 2022, compared to China's 17 million tonnes.

The global LNG markets imported around 22 million tonnes of LNG from the United States during the latest quarter. The figure was the largest volume ever of LNG that one country had exported in a quarter. EU imported more than 10 million tonnes of LNG from the United States during the quarter.

The gaps of TTF prices against NBP and Asian spot LNG prices widened during April, from USD 3 and USD 2 to more than USD 10 and USD 7 per million Btu, respectively, by the end of the month, amid more LNG carrier vessels waiting for discharging slots at European LNG receiving terminals. Most of Europe's spare LNG receiving capacity is in Spain and the United Kingdom, which have limited interconnection capacity to other parts of Europe.

Progresses have been continuing in the LNG project development, in both production projects in North America, the Asia Pacific and the Middle East and LNG import infrastructure in Europe during the past month.

[Asia Pacific]

Japan imported 20.40 million tonnes of LNG during the first quarter of 2022, down 12% from the same period of 2021, though the latest figure was larger than China's 17.28 million tonnes of LNG during the three months of 2022.

JOGMEC published on 22 April 2022 the results of a survey on volumes of LNG handled by Japanese companies. The volumes of LNG handled by Japanese companies in

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FY2018, FY2019, and FY2020 were 96 million tonnes, 105 million tonnes, and 110 million tonnes, respectively.

Japan's NYK announced on 18 April 2022 the order of its third LPG dual-fuel very large LPG / liquefied ammonia gas (NH₃) carrier (VLGC) from Kawasaki Heavy Industries Ltd. (KHI). The ship will be built at KHI's Sakaide shipyard and is set for delivery in 2024.

JGC Holdings Corporation and Kawasaki Kisen Kaisha ("K" Line) announced on 14 April 2022 that JGC Corporation (JGC Global) and "K" Line had been granted an Approval in Principle (AIP) for the design by the American Bureau of Shipping (ABS) establishing a new-concept floating LNG (FLNG) hull design that incorporates existing storage tanks from LNG carriers. The design involves transferring and reusing the LNG storage tanks from existing spherical tank (Moss tank) carriers in the hulls of new FLNG facilities.

Korea Gas Corporation (KOGAS) announced on 22 April 2022 that the company had signed a long-term contract with bp for 1.58 million tonnes per year of LNG imports from the United States for 18 years starting in 2025. The price formula is indexed to Henry Hub prices. This is the first long-term contract between KOGAS and bp, following a basic agreement (HOA) signed in September 2019.

Korea's KBS (Korean Broadcasting System) reported that the Ministry of Trade, Industry and Energy (MOTIE) had decided to supply LNG to Europe from its reserves in a quantity that does not affect Korea's LNG supply and demand as well as market prices.

INPEX CORPORATION and JGC Holdings Corporation announced on 25 April 2022 that they had signed a Memorandum of Understanding (MoU) with PTT Exploration and Production Public Company Limited (PTTEP) on the Thailand Carbon Capture and Storage Initiative.

JERA Co., Inc. announced on 26 April 2022 that it had concluded a memorandum of understanding (MOU) with Thailand's Electricity Generating Public Company Limited (EGCO) to cooperate in the energy transition field. JERA and EGCO will discuss the possibility of collaboration in order to develop LNG value-chain projects and establish a large-scale supply chain for hydrogen and ammonia. JERA is a shareholder with an approximately 12% stake in EGCO through TEPDIA Generating B.V.

Eni announced on 21 April 2022 that the company had signed a Memorandum of Understanding (MoU) with Vietnam's Quảng Trị provincial government to evaluate potential REDD+ (Reducing Emissions from Deforestation and forest Degradation) initiatives and Natural Climate Solutions (NCS) opportunities for carbon credit generation in the area.

According to China's Customs Statistics, the country imported 17.28 million tonnes of LNG during the first quarter of 2022, down 11.2% year-on-year. Including pipeline gas, China imported 27.82 million tonnes of natural gas during the quarter, also down 5.1% year-

on-year. At the same time, the country produced 56.9 bcm of natural gas, increasing by 6.6% from one year earlier, during the first quarter of 2022. Meanwhile, China's domestic LNG production in the year 2021 was 15.451 million tonnes, increasing by 9.2% from 2020.

China State Shipbuilding Corporation (CSSC) announced on 28 April 2022 that it had concluded a construction contract for six LNG carriers, each with capacity for 174,000 cubic meters, with NYK Line, the largest LNG order CSSC had ever received. The vessels will be constructed by CSSC's Hudong-Zhonghua Shipbuilding (Group) Co Ltd.

JGC Holdings Corporation announced on 6 April that the company, in a consortium with Chinese Taipei's construction firm RSEA Engineering Corporation, Do & Find Engineering Consultants and another company, had been awarded an engineering, procurement, construction, and commissioning (EPCC) contract for construction of LNG terminal facilities in Taichung from CPC Corporation, Taiwan.

Osaka Gas Co., Ltd. announced on 6 April that its subsidiary Daigas Gas and Power Solution Co., Ltd. (DGPS) had been awarded Front End Engineering & Design (FEED) and technical consulting service for the Phase-4 Expansion Project of the Taichung LNG terminal. The project includes building 4 LNG storage tanks (each with 180,000 kl storage capacity), regasification facilities and a jetty. After the completion of the project scheduled in 2029, LNG handling capacity of the terminal will increase to 13 million tonnes per year.

Pakistan LNG Limited (PLL) on 21 April 2022 announced LNG cargo tender results to secure six cargoes - four for May and two for June - after the company received 12 bids for 6 spot LNG cargoes in the range of prices at USD 24.1500 - 31.778/million BTU.

ExxonMobil said on 14 April that it was undertaking early front-end engineering design studies (pre-FEED) to determine the potential for carbon capture and storage to reduce greenhouse gas emissions from industries in the Gippsland Basin in Eastern Australia.

Australia's Woodside announced on 14 April that the company had applied to list its shares in the form of American Depositary Shares (ADSs) on the New York Stock Exchange (NYSE), in connection with the proposed merger with the petroleum business of BHP.

Woodside announced on 6 April that the company, as operator for the Scarborough Joint Venture, had received key primary approvals from the Commonwealth-Western Australian Joint Authority to support execution of the Scarborough Project. The Scarborough Joint Venture has received an offer for the pipeline licence to construct the Scarborough pipeline in Commonwealth waters. Approval has also been granted for the Scarborough Field Development Plan (FDP). The milestones follow final investment decisions in November 2021 to approve the Scarborough and Pluto Train 2 developments.

Shell announced on 11 April 2022 that its Prelude FLNG facility had resumed operation after the Australian regulator NOPSEMA's approval.

Australia's Aqua Aerem and Japan's Osaka Gas announced on 12 April a joint development agreement of the Desert Bloom Hydrogen project that will produce renewable hydrogen for domestic and export markets using only offgrid renewable energy and its own atmospheric water source.

Indonesia's PT PERTAMINA, Osaka Gas Co., Ltd., JGC Holdings Corporation (JGC) and INPEX CORPORATION announced on 25 April 2022 that they had entered into a joint study agreement on exploring the feasibility of a clean natural gas and LNG project in Indonesia involving the production of bio-methane from palm oil mill effluent (POME).

JGC Holdings Corporation announced on 25 April 2022 that JGC CORPORATION had signed a Memorandum of Understanding (MOU) with Indonesia's Pertamina to study prospective joint projects in the decarbonization business field.

[North America]

Cheniere Energy announced on 19 April a collaboration with natural gas midstream companies, methane detection technology providers, and leading academic institutions to implement quantification, monitoring, reporting and verification (QMRV) of greenhouse gas (GHG) emissions at natural gas gathering, processing, transmission, and storage systems specific to Cheniere's supply chain. This collaboration builds upon Cheniere's ongoing QMRV collaboration with natural gas producers and LNG shipping providers, both of which commenced in 2021.

Sempra Infrastructure announced on 4 April 2022 that it had entered into a Heads of Agreement (HOA) with affiliates of TotalEnergies, Mitsui & Co. and Japan LNG Investment, LLC, a company jointly owned by Mitsubishi Corporation and NYK Line, for the development of the Cameron LNG Phase 2 export project in Louisiana. Sempra Infrastructure also announced that Cameron LNG had awarded two Front-End Engineering Design (FEED) contracts to Bechtel Energy Inc. and a joint venture between JGC America Inc. and Zachry Industrial Inc. The proposed Phase 2 project is expected to include a single LNG train with a maximum production capacity of 6.75 million tonnes per year of LNG, as well as debottlenecking of the existing three LNG trains.

Sempra Infrastructure and Korea Gas Corporation (KOGAS) announced on 4 April that the companies had entered into a memorandum of understanding (MOU) to explore opportunities in the global energy transition to lower-carbon and zero-carbon fuels.

The U.S. Department of Energy (DOE) issued on 27 April two long-term orders authorizing an additional 0.5 billion cubic feet per day (Bcf/d) (3.8 million tonnes per year) of LNG exports from Golden Pass LNG in Texas and Magnolia LNG in Louisiana: 0.35 from Golden Pass LNG and 0.15 from Magnolia LNG. The two orders align the projects' respective

export authorizations to additional capacity that the Federal Energy Regulatory Commission (FERC) had approved for the projects based on optimized project designs. Golden Pass' first exports are expected in 2024. Magnolia LNG, owned by the Glenfarne Group LLC, is planned to be developed in Lake Charles, Louisiana.

NextDecade Corporation announced on 6 April 2022 a 20-year sale and purchase agreement (SPA) with ENN LNG (Singapore) Pte Ltd, a subsidiary of China's ENN Natural Gas Co., Ltd. for LNG from NextDecade's Rio Grande LNG export project in Texas. ENN LNG will purchase 1.5 million tonnes per year of LNG indexed to Henry Hub on a free-on-board (FOB) basis. The LNG supply will be from the first two trains at RGLNG with the first train expected to start operations as early as 2026. NextDecade anticipates making a positive final investment decision (FID) on a minimum of two trains of the Rio Grande LNG export project in the second half of 2022.

New Fortress Energy (NFE) announced on 26 April 2022 that the U.S. Coast Guard (USCG), in coordination with the Maritime Administration (MarAd), had affirmed the completeness of NFE's deepwater port license application and would proceed with the preparation of an environmental impact statement. NFE's application proposes the ownership, construction, operation, and eventual decommissioning of an offshore natural gas export deepwater port, known as New Fortress Energy Louisiana FLNG, that would be located in Federal waters approximately 16 nautical miles (30 km) off the southeast coast of Grand Isle, Louisiana in a water depth of approximately 30 meters. The deepwater port would allow for the export of approximately 145 billion cubic feet of natural gas per year, equivalent to approximately 2.8 million tonnes per year of LNG. NFE targets beginning operations in the first quarter of 2023.

Excelerate Energy, Inc. announced on 12 April 2022 the pricing of its initial public offering of 16,000,000 shares of its Class A common stock. The shares began trading on the New York Stock Exchange on 13 April.

ExxonMobil said on 26 April that approximately 0.2 bcf per day of natural gas produced from its Permian Basin facilities at Poker Lake, New Mexico had been independently certified and received the top grade for methane emissions management from MiQ.

Exxon Mobil Corporation announced on 29 April 2022 estimated first-quarter 2022 earnings of USD 5.5 billion, up from earnings of USD 2.7 billion in Q1'21. First-quarter results included an unfavourable item of USD 3.4 billion associated with the company's planned exit from the Sakhalin-1 project in Russia. The company noted that commissioning of the Area 4 Coral South Floating LNG project in Mozambique was underway, with first production expected in 2022, and the company had signed the P'nyang Gas Agreement in Papua New

Guinea. Additionally, construction of the Golden Pass liquefaction facilities on the U.S. Gulf Coast remains on schedule, the company said.

Chevron Corporation reported on 29 April earnings of USD 6.3 billion for the first quarter 2022 - its best quarterly performance since 2012 - compared with USD 1.4 billion in first quarter 2021.

Canada's Woodfibre LNG Limited announced on 14 April 2022 that it had issued a Notice to Proceed to McDermott International. The project is expected to move toward major construction commencement in 2023, with substantial completion in 2027. The project will be powered with renewable hydroelectricity.

Guangzhou Development Group announced on 1 April 2022 a contract with Mexico Pacific LNG for LNG purchase and sale of 2 million tonnes per year for 20 years from the date of commercial operation of the project. MPLNG is expected to make a final investment decision (FID) in the second half of 2022 on the first two trains.

[Middle East]

Abu Dhabi's ADNOC Logistics & Services (ADNOC L&S), the shipping and maritime logistics arm of the Abu Dhabi National Oil Company (ADNOC), announced on 12 April 2022 the signing of a Ship Building Contract for the construction of two 175,000 m³ LNG vessels that will join its fleet in 2025. They will be built at the Jiangnan Shipyard in China. In December 2021 the Board of ADNOC endorsed the company's plans to evaluate doubling LNG production capacity from 6 to 12 million tonnes per year.

QatarEnergy announced on 28 April 2022 the award of an engineering, procurement, and construction (EPC) contract for the North Field Expansion Project. A joint venture between Técnicas Reunidas S.A. (TR) and Wison Engineering (Wison) has been selected as the EPC contractor for the expansion of the sulphur handling, storage, and loading facilities within Ras Laffan Industrial City. The only remaining major EPC contract for the delivery of the North Field Expansion Project, comprising the NFE and NFS projects, is the EPC contract for the NFS two onshore processing and liquefaction trains, which is currently planned to be awarded by the end of 2022.

QatarEnergy announced on 12 April 2022 that it had signed time-charter parties (TCPs) with a subsidiary of Mitsui O.S.K Lines (MOL) for the long-term charter and operation of 4 LNG ships, constituting the first batch of TCPs awarded under QatarEnergy's LNG shipping program. LNG carrier shipbuilding contracts were signed between MOL and Hudong-Zhonghua Shipbuilding Group (Hudong).

[Africa]

In a statement on Wednesday 27 April 2022, Algeria's energy ministry warned that gas supplies to Spain could be suspended if that gas was diverted elsewhere. Spain's Ministry for the Ecological Transition has reiterated no intension of such diversions.

Eni and Algeria's Sonatrach announced on 11 April that the two companies had signed an agreement that will allow Eni to increase gas imports through the TransMed / Enrico Mattei pipeline under the umbrella of the long-term gas supply contract starting from autumn 2022.

Eni announced on 13 April 2022 that Egypt's EGAS and Eni had signed a framework agreement that would allow to maximize gas production and LNG exports. The agreement aims to promote Egyptian gas export to Europe, specifically to Italy, in the context of the transition to a low carbon economy. The agreement, together with the one signed for the restart of Damietta liquefaction plant in 2021, will provide LNG cargoes for overall volumes of up to 3 BCM in 2022 for Eni LNG portfolio bound to Europe and Italy, Eni added. Eni announced on the same day new oil and gas discoveries through AGIBA, a JV between Eni and EGPC, in the Meleiha concessions, in Egypt's Western Desert.

Eni announced on 21 April that the Ministry of Hydrocarbons of the Republic of Congo and Eni had signed a letter of intent (LOI) to increase gas production and export primarily through the development of an LNG project with start-up expected in 2023 and a capacity of over 3 million tonnes per year once fully operational.

[Europe / Russia]

The European Commission's quarterly gas report outlined the volatility of gas prices in the fourth quarter of 2021. Russian pipeline supplies fell by 24% year-on-year and covered only 37% of extra-EU net gas imports in Q4 2021 (the lowest share in the last eight years), followed by Norway (24%), and LNG imports, amounting to 22%.

The British government released on 7 April 2022 "Policy paper - British energy security strategy". The prime minister said, "Gas is currently the glue that holds our electricity system together and it will be an important transition fuel. . . There is no contradiction between our commitment to net zero and our commitment to a strong and evolving North Sea industry. Indeed, one depends on the other."

INEOS said on 10 April that it had written to the government offering to develop a Shale test site to demonstrate that the technology can be secure in the United Kingdom.

The Netherlands' Gasunie, HES International (HES) and Vopak announced on 11 April their plan to develop an import terminal for green ammonia as a hydrogen carrier. The ACE terminal on the Maasvlakte will be operational from 2026.

Gasunie announced on 25 April the start of the tendering procedure for market parties interested in importing LNG at the proposed terminal in Eemshaven. Exmar's floating LNG plant is expected to arrive at Eemshaven in early August. The EemsEnergyTerminal terminal will be used initially for LNG, and later for green hydrogen.

Germany's Uniper announced on 11 April that the company would text a former gas storage facility to store hydrogen.

Salzgitter AG announced on 13 April that its subsidiary Mannesmann Grossrohr GmbH (MGR) had been commissioned by transmission system operator Open Grid Europe GmbH (OGE) with the delivery of line pipes for the Wilhelmshaven-Pipeline Link (WPL).

Tree Energy Solutions (TES) announced on 25 April an open season to import LNG at its Wilhelmshaven regasification terminal. TES is planning for initial capacity to import up to 16 - 20 bcm per year from 2025.

Dow Inc. announced on 11 April 2022 that it had signed an agreement to take a minority stake in the Hanseatic Energy Hub GmbH (HEH). The HEH consortium, which includes Dow, Fluxys, Partners Group and Buss Group, is planning to build, own, and operate an import terminal for liquified gases on Dow's Stade, Germany industrial park. This zero-carbon emission terminal is to be built by 2026 and will be co-located with Dow's facilities in Stade, with projected regasification capacity of 13.3 bcm per year.

Italy's Eni reported net profit of EUR 3.58 billion for the first quarter of 2022, up from EUR 856 million a year earlier. The company said the currency of the contract for Russian gas delivery was euro and the company had not opened an account in rubles.

Estonia's and Finland's Ministries of Economic Affairs announced on 7 April that the countries had agreed to the joint leasing of a floating terminal for LNG to supply gas to both countries. The plan foresees the two sides establishing the hauling quays on the northern and southern shores of the Gulf of Finland. The floating terminal is planned to be in place by autumn.

Germany's Wintershall DEA said on 28 April that the company had decided to maintain its participation in its existing projects in Russia, as in the event of a withdrawal, billions in assets would fall to the Russian state.

European Union Council announced on 8 April the fifth package of sanctions against Russia that bars the delivery of goods and technology suited for use in oil refining and liquefaction of natural gas.

The International Gas Union (IGU) announced on 7 April 2022 that its Council had completed its electronic voting process approving the suspension, until further notice, of engagement of Russian Federation entities in any IGU activities.

Russia's Gazprom announced on 1 April preliminary statistics of gas production and

gas supply in the first three months of 2022. The company produced 135 bcm of natural gas, the same as the same period in 2021. 38.5 bcm was exported to distant neighbours, a 27.1% decrease (or 14.3 bcm) compared with the same period in 2021.

Gazprom reported on 28 April 2022 record high earnings of USD 29 billion for 2021, although the company forecast a fall in gas output of about 4% in 2022. Gazprom announced on 21 April that a record volume of gas was delivered to domestic consumers in the fourth quarter of 2021 and the first quarter of 2022.

Gazprom announced on 27 April that it had cut off gas supplies to Bulgaria's Bulgargaz and Poland's PGNiG after the buyers failed to switch payments to ruble.

TotalEnergies said on 28 April 2022, "Taking into account notably the impact of new sanctions prohibiting the export of LNG technologies benefiting. . . execution ability of the Arctic LNG 2 project, TotalEnergies took an impairment of USD 4.1 billion in its accounts as of 31 March 2022." Russia's NOVATEK announced on 22 April that the company had decided not to publish its financial statements and not to hold a teleconference with investors on the first quarter financial results.

[South America]

The Panama Canal Authority (ACP) announced on 1 April 2022 a proposal for new toll structure for 2023 and thereafter. ACP says that the new toll structure will reduce the number of tariffs from 430 to less than 60, providing customers with a simpler value-based pricing structure with greater visibility and predictability. For the LNG sector, the special round trip ballast tariff of an around 10% discount is no longer included in the new proposal. The expected impact on an LNG Vessel with 3.3 trillion btu through the Neopanamax locks is calculated as an increase of USD 0.05 per million btu by 2025, which would represent 0.7% of each unit's final market price, according to the authority. This is likely to be based on a single trip basis. For a 174,000 m³ LNG carrier, the round-trip toll would increase from USD 851,340 in 2022 to USD 1,016,310 in 2023.

[Global issues]

LNG shipping industry multi-sector coalition SEA-LNG claimed on 21 April 2022 that LNG-fuelled engines had GHG benefits compared with oil-based engines.

Rystad Energy said on 7 April 2022 that global energy spending in the year will rise to USD 2.1 trillion.

Reference: Company announcements, Cedigaz News Report.

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