

LNG Review February 2023
- Recent issues and events -
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Introduction

Freeport LNG of the United States shipped out its LNG cargo in early February for the first time in eight months. The first two trains, out of three, were authorised to return to commercial operations by the Federal Energy Regulatory Commission (FERC) later in the month. The plant is expected to return to full service within the next couple of months.

The largest LNG producing company of the United States, Cheniere Energy, announced that it had initiated the pre-filing review process with FERC for the proposed Sabine Pass Stage 5 Expansion Project. The project is being designed for total production capacity of up to 20 million tonnes per year with accommodations for waste heat recovery as well as carbon capture from acid gas removal units. The project expects in-service dates from the second half of 2028 to 2030.

The partners of Israel's Leviathan reservoir in the Mediterranean Sea revealed a plan of Front-End Engineering and Design (Pre-FEED) for the Phase 1B development, including a future construction of a floating LNG (FLNG) facility of an annual production capacity of 4.6 million tonnes of LNG.

Australia's federal government announced in early February the new draft guidelines for the country's Domestic Gas Security Mechanism (ADGSM) which it said was designed to balance between the need to guarantee sufficient domestic gas supplies (to the east coast market) and maintaining the country's reputation as a stable and reliable supplier to the international LNG market. The east coast LNG exporters are supposed to obtain permission to export LNG in any quarter forecast to have a shortfall of gas supply in the domestic market.

While the January edition of this review mentioned that China's LNG import was down 19.5% in 2022, the country's natural gas consumption in 2022 was down 1.7% year-on-year at 366.3 bcm. Its natural gas production grew by 6.2% to reach 217.9 bcm.

Germany's third FSRU received its first LNG cargo from Abu Dhabi.

* 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]

Japan's Mitsui O.S.K. Lines, Ltd. (MOL) and Air Water Inc. announced on 22 February 2023 a Memorandum of Understanding (MoU) to study the trial use of liquefied bio-methane (LBM) derived from cattle manure, in LNG-fuelled vessels. LBM is produced from cattle manure in the Tokachi region of Hokkaido by Air Water. The goal is to use LBM on the MOL's coastal LNG-fuelled vessels in the first half of FY2023 (April - September).

Maritime and Port Authority of Singapore (MPA) announced on 6 February 2023 that it had decided to discontinue the 50% harbour craft port dues concession which was launched in 2021 for floating storage units / floating storage regasification units supporting LNG bunkering and breakbulk activities in port. The delivery of Singapore's first LNG bunker vessel in March 2021, has enabled ship-to-ship LNG bunkering.

According to China's national statistics, China's natural gas consumption in 2022 was down 1.7% year-on-year at 366.3 bcm. Its natural gas production grew by 6.2% to reach 217.9 bcm.

China's Lianyungang City government announced on 13 February 2023 that Jiangsu Huadian Ganyu LNG terminal had started construction at Ganyu port, Lianyungang in China's eastern Jiangsu province. Operations are scheduled to start in 2026.

Pakistan's Engro Corporation said on 16 February 2023 that Engro Elengy Terminal (Pvt) Limited handled 74 vessels during 2022 versus 72 vessels in 2021.

Australia's Department of Industry, Science and Resources announced on 9 February 2023 the new proposal in the form of draft guidelines for the Australia's Domestic Gas Security Mechanism (ADGSM) which it said was designed to balance between the need to guarantee sufficient domestic gas supplies (to the east coast market) and safeguarding Australia's global reputation as a stable and reliable supplier of energy. The new proposal is that in any quarter forecast to have a shortfall of gas supply, the east coast LNG exporters would have to obtain permission to export LNG.

Australia's Origin Energy Limited announced on 16 February 2023 that the consortium of Brookfield Asset Management and MidOcean Energy, an LNG company formed and managed by EIG had substantially completed due diligence to acquire all the issued shares in Origin.

Australia's Santos announced on 14 February 2023 that the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) had approved the Offshore Project Proposal (OPP) relating to the Dorado development. Dorado is a proposed phased liquids and gas development, with an initial phase of liquids development with gas re-injection and the potential for a second phase development to recover and pipe the gas to the Western Australian domestic and LNG markets. Following the grant of a Production

Licence in April 2022, Dorado now has the primary regulatory approvals required to support development, according to the announcement. Santos has an 80% interest in Dorado and a 70% interest in the recently discovered adjacent Pavo field, and operates both fields. The remaining interests are held by Carnarvon Energy.

Australia's Woodside announced on 6 February 2023 that the Sunrise Joint Venture (SJV), comprising TIMOR GAP (56.56%), Operator Woodside Energy (33.44%), and Osaka Gas Australia (10.00%), had affirmed its commitment to undertake a concept select program for the development of the Greater Sunrise fields. The announcement says the SJV will consider all of the key issues for delivering the gas, for processing and LNG sales, to Timor-Leste compared to delivering the gas to Australia. In parallel to the concept select program, the SJV is progressing the negotiation of the new Production Sharing Contract, Petroleum Mining Code and associated agreements with the Timor-Leste and Australian Governments.

[North America]

Cheniere Energy, Inc. announced on 23 February 2023 that it had initiated the pre-filing review process under the National Environmental Policy Act (NEPA) with the Federal Energy Regulatory Commission (FERC) for the proposed Sabine Pass Stage 5 Expansion Project. The project is being designed for total production capacity of 20 million tonnes per year, including up to three liquefaction trains, each with a production capacity of 6.5 million tonnes per year of LNG, a boil-off-gas (BOG) re-liquefaction unit with an approximate production capacity of 0.75 million tonnes per year of LNG, and two 220,000 m³ LNG storage tanks, with accommodations for waste heat recovery as well as carbon capture from acid gas removal units. The project's targeted in-service and first LNG is expected by 2030.

FERC on 9 February 2023 wrote to the Freeport LNG Development, L.P. granting approval "to return to service LNG Loop 1 circulation and Dock 1 for ship loading" responding to a request filed on 2 February.

Freeport LNG Development, L.P. announced on 21 February that it had received regulatory approval to commence commercial operations of the company's natural gas liquefaction and export facility. The authorization provides for the immediate full return to service of one liquefaction train, that has already restarted, and the incremental restart and full return to service of a second train. The restart and return to service of the third liquefaction train will require subsequent regulatory approval once certain operational conditions are met. A conservative ramp-up profile to establish three-train production of approximately 2.0 billion cubic feet per day is anticipated to occur over the next several weeks as stable operation of each incremental train is established and maintained. Operations are initially utilizing two of Freeport LNG's three LNG storage tanks and one of its two LNG

berths. The second LNG berth and third LNG storage tank are expected to return to service in May. First LNG production and ship loading from the facility began on 11 February.

In a letter of 6 February 2023 to FERC, NextDecade Corporation expressed its frustration at regulatory uncertainty preventing the company from moving forward with its Rio Grande LNG (RGLNG) project.

Venture Global LNG and China Gas Holdings Limited announced on 23 February 2023 that China Gas Hongda Energy Trading Co., Ltd. and Venture Global LNG had signed two 20-year LNG Sales and Purchase Agreements (SPA). China Gas will buy 1 million tonnes each per year of LNG on a free on board (FOB) basis from Plaquemines LNG and from the CP2 LNG export facility, respectively, both in Louisiana.

Southern California Gas Company (SoCalGas) provided an update on natural gas prices across the West Coast on 15 February 2023. After a significant drop from unprecedented January natural gas commodity prices, market prices for March 2023 are currently trending closer to 2022 prices. Improved weather conditions and a related reduction in natural gas usage have led prices to continue to fall along the West Coast, according to the U.S. Energy Information Administration (EIA). In addition, the restoration of service to the out-of-state pipeline, which has been offline for two years, is expected to increase supply capacity to the Southwest. SoCalGas will file March core procurement prices (rates) with the California Public Utilities Commission (CPUC) at the end of February. The core procurement rate reflects the price SoCalGas pays for natural gas for residential and business customers.

Mexico Pacific announced on 7 February 2023 the execution of two long-term Sales and Purchase Agreements (SPAs) with ExxonMobil LNG Asia Pacific (EMLAP) for the sale of a combined 2 million tonnes per year of LNG. EMLAP will purchase LNG on a free-on-board (FOB) basis from the first two trains of Mexico Pacific's anchor LNG export facility, Saguaro Energía LNG, located in Puerto Libertad, Sonora, Mexico over a 20-year term. ExxonMobil also has an option for 1 million tonnes per year from Train 3.

Sempra Infrastructure, Mexico's CFE (Comisión Federal de Electricidad), and Carso Energy announced on 14 February 2023 a Memorandum of Understanding (MOU) to advance a potential strategic alliance for the joint development of natural gas transportation infrastructure between the states of Sonora and Baja California, Mexico. The agreement is intended to increase CFE's electricity generation capacity and availability of natural gas in the northwest region of Mexico. The length of the proposed natural gas pipeline would be approximately 281 miles (452 km) and would be interconnected with the already existing "Samalayuca - Sásabe" and "Sásabe - Guaymas" transportation systems in Mexico, owned by affiliates of Carso Energy and Sempra Infrastructure, respectively.

[Middle East]

Oman LNG announce on 7 February 2023 that it had signed a binding term-sheet agreement with China International United Petroleum and Chemical Co. (UNIPEC) to supply 1 million tonne per year of LNG starting from 2025 for 4 years.

NewMed Energy announced on 21 February 2023 that the partners of Israel's Leviathan reservoir approved budgets for 2023 for the performance of Front-End Engineering and Design (Pre-FEED) for Phase 1B for the development of the Leviathan reservoir. The partners are promoting a future construction of a floating LNG (FLNG) facility of an annual production capacity of 4.6 million tonnes of LNG. The partners include NewMed Energy 45.34%, Chevron Mediterranean Limited 39.66% and Ratio Energies 15.00%.

[Africa]

The International Gas Union (IGU) in partnership with Hawilti Ltd. released on 14 February 2023 a study on Gas for Africa, assessing the potential for domestic gas resources to energise Africa in line with the global energy transition. Africa's domestic gas markets remain under-developed or non-existent, especially south of the Sahara, and much of Africa's abundant natural gas resource development has been for export to the rest of the world. In the short-term, natural gas can also provide an immediate emissions reductions benefit when it replaces higher emitting energy sources. Access to gas can provide stable electricity in countries with no lower-emission alternatives and strengthen power systems to add more renewable energy, and begin decarbonising energy supply.

New Fortress Energy Inc. (NFE) announced on 6 February 2023 that it had reached an agreement with Golar LNG Limited for the sale of NFE's ownership stake in the Hilli in exchange for the return of 4.1 million NFE shares and USD 100 million in cash. GLNG will acquire NFE's entire interest in the floating liquefaction facility Hilli. FLNG Hilli is currently located offshore Kribi, Cameroon. Its customers are oil and gas company Perenco and Cameroon's national oil firm Société Nationale des Hydrocarbures (SNH).

bp announced on 27 February 2023 that bp and partners had confirmed the development concept for the second phase of the Greater Tortue Ahmeyim (GTA) LNG. The partnership - composed of bp, PETROSEN, Société Mauritanienne des Hydrocarbures (SMH) and Kosmos Energy - will evaluate a gravity-based structure (GBS) as the basis for the GTA Phase 2 expansion project (GTA2) with total capacity of between 2.5 - 3.0 million tonnes per year. GBS LNG developments have a static connection to the seabed with the structure providing LNG storage and a foundation for liquefaction facilities. The announcement also said that the partnership would consider powering LNG liquefaction

using electricity to help drive operational emissions lower. GTA is located 120 km offshore in water depth of 2,850 m. Phase 1 - currently under development - will export gas to an FPSO approximately 40 km offshore where the gas will be processed and liquids separated, before exporting gas onward to floating LNG facilities 10 km offshore. It is expected to produce around 2.3 million tonnes of LNG per year.

[Europe / Russia]

The European Commission announced on 13 February 2023 proposed detailed rules to define what constitutes renewable hydrogen in the EU. These Acts are part of a broad EU regulatory framework for hydrogen which includes energy infrastructure investments and state aid rules, and legislative targets for renewable hydrogen for the industry and transport sectors. They will provide regulatory certainty to investors as the EU aims to reach 10 million tonnes of domestic renewable hydrogen production and 10 million tonnes of imported renewable hydrogen in line with the REPowerEU Plan.

According to Bruegel, since the start of the energy crisis in September 2021, €768 billion has been allocated and earmarked across European countries to shield consumers from the rising energy costs. €657 billion has been in the EU, of which €265 billion has been earmarked by Germany alone, along with €103 billion in the United Kingdom and €8.1 billion in Norway.

Spain's gas pipeline grid operator Enagás announced on 15 February 2023 that it had withdrawn from the planned acquisition of a 20% stake in BBL pipeline from Germany's Uniper. BBL is a subsea pipeline connecting the United Kingdom and the Netherlands. Enagás said that the other shareholders of BBL, Netherlands' grid operator Gasunie (60%) and Belgium's Fluxys (20%), had exercised their right of first refusal.

Netherlands' Gasunie announced on 14 February 2023 that options to further expand existing capacity at Eemshaven and at Gate terminal were being further explored. A new floating LNG terminal in the port of Terneuzen is not feasible in the short term, according to the announcement.

Gasunie announced on 9 February 2023 that the company intended to realise a hydrogen network in the German part of the North Sea. The company expects to see the network play an important role in the large-scale import of hydrogen from Norway and the increasing supply of green hydrogen from future wind farms in the North Sea. To develop the offshore hydrogen network, the company has now applied to the European Commission for Project of Common Interest (PCI) status. The aim is to commission the network from 2030.

Höegh LNG Holdings Ltd. announced on 10 February 2023 that it had signed a new loan facility agreement with a group of banks to refinance Höegh Esperanza and Hoegh

Gannet, both employed on long-term contracts in Germany. The new loan facility agreement is for a total amount of USD 685 million and has a tenor of 10 years. The loan amount will be applied to repay the existing loan facilities and general corporate use. The facility is split in two tranches, one per vessel.

Germany's gas and hydrogen storage association Initiative Energien Speichern (INES) said on 9 February 2023 that there was no chance of a shortage in the current winter and for the next winter reaching a 100% refilling level by 1 October could be achieved assuming high levels of LNG imports.

Germany's RWE announced on 15 February 2023 that the Brunsbuettel Elbehafen port had received its first LNG cargo on the "Ish" from the Abu Dhabi National Oil Company (ADNOC) at the Floating Storage and Regasification Unit (FSRU) "Hoegh Gannet", which was chartered by RWE on behalf of the German government. RWE and ADNOC signed a memorandum of understanding (MoU) in 2022 on several years of LNG supplies to be delivered to Germany from 2023. RWE says it also plans to build an import terminal for green ammonia, which - as a liquefied hydrogen derivative - can make a contribution towards supplying Germany with green hydrogen. Around 300,000 tonnes per year of green ammonia are to be imported via this terminal from 2026.

Estonia's Eesti Gaas announced on 3 February 2023 that it had made agreements with LNG terminals to bring a total of ten LNG cargos by the fall of 2023 - three deliveries to the port of Klaipėda in Lithuania in the winter and seven to the port of Inkoo in Finland in the spring and summer.

According to the Russian State Statistics Service, Russia reduced natural gas production by 13.4% year-on-year to 573 bcm in 2022. Russia's LNG production in 2022 reached 32.5 million tonnes, 8.1% more than in 2021.

The United Nations Environment Programme (UNEP) announced on 23 February 2023 that it had conducted an analysis on the magnitude of methane leaked following the incident on the Nord Stream natural gas pipelines, in the Baltic Sea, in September 2022. The analysis, produced by UNEP's International Methane Emissions Observatory (IMEO), estimates the plausible range of total methane emissions leaked during the incident as 75 - 230 kt.

Russia's NOVATEK announced on 6 February 2023 that the company and India's Deepak Fertilisers and Petrochemicals Corporation Ltd. signed a non-binding Memorandum of Understanding (MoU) in the supply of LNG and low-carbon ammonia. The MoU envisages spot and long-term LNG deliveries to Deepak Fertilisers, including from the Arctic LNG 2 project. The parties also intend to cooperate in long-term supply of low-carbon hydrogen and ammonia produced with the use of carbon capture and underground storage, cracking, and

renewable energy sources at NOVATEK's future gas chemical site in Yamal. The pre-FEED study for the gas chemical complex was completed in 2022.

[Global issues]

The International Energy Agency (IEA) announced that ministers responsible for energy from around 40 countries took part in an IEA Ministerial meeting on Gas Markets and Supply Security on 15 February 2023.

IEA published Global Methane Tracker 2023 on 21 February 2023. The Tracker found that the global energy industry was responsible for 135 million tonnes of methane released into the atmosphere in 2022, only slightly below the record highs seen in 2019. In 2022 alone, more than 500 super-emitting events were detected by satellites from oil and gas operations and a further 100 were seen at coal mines.

Reference: Company announcements, Cedigaz News Report.

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