

## LNG Review February 2021 - Recent issues and events -

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### **Introduction**

In early February 2021, the largest final investment decision (FID) on an LNG project in the history was announced in Qatar. The sanctioned capacity this time was already ten times as large as the total capacity sanctioned in the world in 2020 from only one project in Mexico. Another key feature of the Qatari project is inclusion of GHG mitigation measures. Decarbonisation and net-zero initiatives are on the rise - including the JERA - Petronas MOU announced also in early February.

Cheniere Energy, the largest LNG exporter in the United States, announced in late February 2021 plans to provide its LNG customers with greenhouse gas (GHG) emissions data associated with each LNG cargo produced at the company's liquefaction facilities from 2022. Singapore's Pavilion Energy announced that each LNG cargo would be accompanied by a statement of its GHG emissions under its LNG purchase agreement with Chevron.

On the LNG production project development front, Australia's Woodside and Santos each confirmed their schedules of a targeted final investment decision - the second half of 2021 for Woodside's Scarborough and the first half of 2021 for Santos' Barossa, respectively.

According to trade statistics of Japan, the country imported about 20 LNG cargoes at prices higher than USD 10 per million Btu in January out of more than 100 cargoes imported in the country during the month. There were four cargoes priced higher than USD 20.

Japan imported 8.06 million tonnes of LNG in January 2021, 7.3% higher than same month of 2020, the first over-8-million-tonne import since February 2018. In addition, the LNG import of 0.95 million tonnes from the United States was the largest monthly volume since the import from the country began.

Due to record-low temperatures, natural gas production in the United States fell by more than 20% in the middle of February, resulting in temporally outages of LNG production and export at some plants. The decline in natural gas production is primarily because of freeze-offs, caused by freezing of liquid

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\* 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.

contents in raw natural gas at the wellhead and in gathering lines.

**[Asia Pacific]**

JERA and Petronas announced in early February 2021 that they had concluded a Memorandum of Understanding (MOU) on cooperation in the decarbonization sector. The companies will discuss opportunities to cooperate in promoting the use of LNG in Asian countries and in establishing supply chains for ammonia and hydrogen fuels. PETRONAS said that it was already producing blue hydrogen as a by-product from its facilities and would be exploring the commercial production of green hydrogen in the near future. PETRONAS further said that the companies would explore the establishment of a global bunkering supply network.

Petronas announced on 11 February 2021 that its subsidiary Petronas Trading Corporation Sdn Bhd (Petco) had signed a memorandum of collaboration (MoC) with Sumitomo Corporation to jointly market and supply LNG bunker and related services through Petronas Marine brand in both Malaysia and Tokyo Bay, Japan.

ITOCHU announced on 26 February 2021 that it had agreed to a strategic collaboration on the development of a hydrogen value chain with Air Liquide, and ITOCHU ENEX. The three companies will start by considering local-production-for-local consumption business models in major metropolitan areas, and explore a competitive hydrogen production, supply system.

Pavilion Energy announced on 22 February 2021 that Pavilion Energy and Chevron had signed a six-year LNG sale and purchase agreement (SPA) for 0.5 million tonnes of LNG per year to Singapore from 2023. Each LNG cargo will be accompanied by a statement of its greenhouse gas (GHG) emissions measured from wellhead to discharge port. Pavilion Energy and its strategic partners are committed to develop and implement a GHG quantification and reporting methodology for LNG. The methodology is being developed based on internationally recognised standards and will cover emissions from wellhead-to-discharge terminal, including LNG transportation.

GAIL (India) said that it expected to cease overseas sales of LNG it secured from the United States from 2023, as local demand in India rises. GAIL buys 5.8 million tonnes per year of LNG from two projects in the United States.

During its 2020 results reporting on 18 February 2021, Australia's Woodside announced that Scarborough was on track for a targeted FID in the second half of 2021, with around 50% of the company's expected equity gas production under contract. In the second half of 2020, the company optimised the project schedule and increased the offshore capacity of Scarborough by approximately 20% to 8 million tonnes per year of LNG. One of the

company's priorities included reduction of its interest in Pluto Train 2 to around 50%. Woodside announced on 19 February that the company had entered into a sale and purchase agreement (SPA) with RWE Supply & Trading for 0.84 million tonnes per year of LNG from Woodside's global portfolio for a term of seven years commencing in 2025. Woodside said that the SPA also provided the opportunity for Woodside and RWE to explore the potential for carbon-neutral LNG production and trading.

Western Gas, operator and 100% owner of the Equus Gas Project, announced on 24 February 2021 that it had signed an MOU with APA Group to undertake a study to supply Equus gas to Western Australia and the East Coast via a transcontinental pipeline. The company said that the resource is sufficient to supply 350 TJ/d (2.35 million tonnes per year) of gas for more than 15 years. Western Gas plans to develop the fields via a 210 km offshore pipeline to the Ashburton North Strategic Industrial Area (ANSIA).

During its 2020 results reporting on 18 February 2021, Australia's Santos announced that the Barossa LNG project remained on-track for a final investment decision (FID) in the first half of 2021.

PETRONAS confirmed on 10 February 2021 a gas discovery from the Lang Lebah-2 exploration appraisal well in Block SK410B Production Sharing Contract (PSC), located in the Central Luconia Province, about 80 kilometres off the coast of Sarawak, offshore Malaysia. PTTEP HK Offshore Limited is the operator for the Block SK410B partnering with KUFPEC Malaysia (SK-410B) Limited and PETRONAS Carigali Sdn Bhd.

PETRONAS announced on 15 February 2021 that its second Floating Liquefied Natural Gas (FLNG) facility, PFLNG DUA, had achieved its first LNG production. The facility is currently located at the Rotan gas field, 140 km off Kota Kinabalu, Sabah. PFLNG DUA is expected to deliver its first LNG cargo to customers by the middle of March 2021. PTT Exploration and Production Public Company Limited (PTTEP) announced on 16 February the start-up of natural gas production from Rotan and Buluh deepwater fields for delivery to PFLNG DUA facility.

### **[North America]**

According to the EIA's (Energy Information Administration) February 2021 Natural Gas Monthly, total exports of natural gas increased by 13.1%, from 12.8 Bcf/d in 2019 to 14.4 Bcf/d in 2020. LNG exports increased by 31.0%, from 5.0 Bcf/d in 2019 to 6.5 Bcf/d (50 million tonnes) in 2020. Dry natural gas production decreased by 1.9% for the year, from 93.1 Bcf/d in 2019 to 91.3 Bcf/d in 2020. Estimated natural gas consumption decreased by 2.3%, from 85.2 Bcf/d in 2019 to 83.3 Bcf/d in 2020.

Intercontinental Exchange (ICE) announced on 10 February 2021 plans to launch

LNG freight futures contracts based on Spark Commodities (Spark) price assessments on 22 March 2021, subject to regulatory approval.

Cheniere Energy announced on 24 February 2021 that it planned to begin providing its LNG customers with greenhouse gas (GHG) emissions data associated with each LNG cargo produced at the Sabine Pass and Corpus Christi liquefaction facilities. The Cargo Emissions Tags (CE Tags) are designed to enhance environmental transparency by quantifying the estimated GHG emissions of LNG cargoes from the wellhead to the cargo delivery point, and are expected to be provided to customers beginning in 2022. The CE Tags will be calculated utilizing Cheniere's proprietary lifecycle analysis (LCA) model, which has been built incorporating the accounting frameworks from LCAs created by the U.S. Department of Energy's (DOE) National Energy Technology Laboratory, and will utilize publicly available data from value chain participants, as well as operational data from both the Sabine Pass and Corpus Christi liquefaction facilities.

In its announcement of Reports Fourth Quarter and Full Year 2020 Results Cheniere Energy said it entered into mid-term LNG sales agreements during the fourth quarter 2020 for portfolio volumes aggregating over 4 million tonnes of LNG with multiple counterparties and with contract tenors ranging from five to approximately 11 years.

A virtual signing ceremony of a trade and investment Memorandum of Understanding (MOU) between the State of West Virginia and the Vietnam Ministry of Industry and Trade was held. The MOU will promote cooperation on a range of issues critical to West Virginia, including the exportation of coal and natural gas.

After the extreme winter weather disruption in the previous week, Cameron LNG restarted all trains over the weekend, resuming LNG production and cargo loading.

Venture Global LNG announced on 11 February 2021 that it had closed a USD 500 million term loan with JPMorgan Chase, Morgan Stanley, Mizuho Bank, and Bank of America. The proceeds will be used to fund pre-FID construction activities at the company's Plaquemines LNG export project as well as for general corporate purposes.

Kinder Morgan and Brookfield Infrastructure Partners announced on 22 February 2021 that they had agreed to sell a 25% minority interest in Natural Gas Pipeline Company of America LLC (NGPL) to a fund controlled by ArcLight Capital Partners. Upon closing, KMI and Brookfield Infrastructure will each hold a 37.5% interest in NGPL, and KMI will continue to operate the pipeline. NGPL is the largest transporter of natural gas into the high-demand Chicago-area market as well as one of the largest interstate pipeline systems in the country. It is also a major transporter of natural gas to large LNG export facilities and other markets located on the Texas and Louisiana Gulf Coast. NGPL has approximately 9,100 miles (14,645 km) of pipeline, more than 1 million compression horsepower and 288 billion cubic feet (Bcf)

(6 million tonnes) of working natural gas storage.

ZIM Integrated Shipping Services, and Seaspan Corporation, a wholly owned subsidiary of Atlas Corporation, announced on 12 February 2021 a strategic agreement for the long-term charter of ten 15,000 TEU LNG dual-fuel container vessels, to serve ZIM's Asia - U.S. East Coast trade.

Air Products announced on 1 February 2021 that it had signed an agreement to provide its proprietary LNG technology, equipment and related process license and advisory services to the Energía Costa Azul (ECA) LNG export project. Air Products' facility in Florida will manufacture the coil wound heat exchangers (CWHE) for its AP-DMRTM LNG process technology. The LNG equipment will be able to produce three million tonnes per year.

### **[Middle East]**

Qatar Petroleum (QP) announced on 8 February 2021 the final investment decision for the North Field East Project (NFE), which will raise Qatar's LNG production capacity to 110 million tonnes per year. In addition to LNG, the project will produce condensate, LPG, ethane, sulphur and helium. It is expected to start production in the fourth quarter of 2025. At the same time a signing ceremony was held to celebrate the execution of the project's key onshore engineering, procurement and construction (EPC) contract. The contract was signed with Chiyoda Corporation and Technip Energies. The main scope of the EPC contract is the construction of 4 mega LNG trains with a capacity of 8 million tonnes per year each, with associated facilities for gas treatment, natural gas liquids recovery, as well as helium extraction and refining within Ras Laffan Industrial City. The total cost of the NFE project will be USD 28.75 billion. QP said that NFE's CO<sub>2</sub> capture and sequestration (CCS) system will be integrated with the wider CCS scheme in Ras Laffan. QP is in the process of procuring power from the 800 megawatt solar power plant currently under construction in Al-Kharsaah, in addition to a further 800 megawatts of solar power which QP will construct in the near future as part of its plans to have a solar power portfolio of more than 4,000 megawatts by 2030. A 'jetty boil-off gas' recovery system will help reduce greenhouse gas emissions (GHG) by approximately a further 1 million tonnes per year of CO<sub>2</sub> equivalent. The next phase of expansion, referred to as the North Field South Project (NFS), will further increase Qatar's LNG production capacity to 126 million tonnes per year. With an expected production start date in 2027, the NFS project involves the construction of two additional mega LNG trains. QP is evaluating further LNG capacity expansions beyond 126 million tonnes per year.

Chiyoda Corporation and TechnipFMC announced on 9 February 2021 that CTJV, a joint venture between Chiyoda and Technip Energies, has been awarded an engineering, procurement, construction and commissioning (EPCC) contract by QP for the onshore

facilities of the North Field East Project (NFE). The award will cover the delivery of 4 mega trains of a capacity of 8 million tonnes per year of LNG, and associated utility facilities, as well as a large CO<sub>2</sub> Carbon Capture and Sequestration (CCS) facility, leading to more than 25% reduction of Green House Gas (GHG) emissions when compared to similar LNG facilities.

QP announced on 22 February that it had entered into a long-term Sale and Purchase Agreement (SPA) with Vitol for the supply of 1.25 million tonnes per year of LNG to Vitol's final customers in Bangladesh with deliveries commencing in 2021. QP announced on 26 February that it had entered into a long-term Sale and Purchase Agreement (SPA) with Pakistan State Oil Company (PSO) for 3 million tonnes per year of LNG for 10 years from 2022. This is the second such agreement between Qatari and Pakistani entities since 2016. The latest agreement raises the total of long-term LNG supplies from Qatar to Pakistan to 6.75 million tonnes per year.

Saipem announced on 22 February 2021 that it had received from Qatargas a Letter of Award for the development of the North Field Production Sustainability Offshore Project. The scope of work encompasses the Engineering, Procurement, Construction and Installation of offshore facilities for the extraction and transportation of natural gas, including platforms, supporting and connecting structures, subsea cables and anticorrosion internally clad pipelines. The project also encompasses the decommissioning of a pipeline and other significant modifications to existing offshore facilities.

The Israel Ministry of Energy announced on 22 February 2021 that energy ministers of Israel and Egypt had agreed on the construction of offshore gas pipeline from the Leviathan gas field to the liquefaction facilities in Egypt, in order to increase the gas exports to Europe through the liquefaction facilities in Egypt.

### **[Africa]**

Eni announced on 22 February 2021 that the first LNG cargo since 2012 from the Damietta liquefaction plant in Egypt was produced and lifted.

In its 2020 report, Golar LNG said that it would explore opportunities to separate the FLNG business.

UTEC, a global surveying company and part of marine energy and infrastructure services group Acteon, announced on 25 February 2021 that it had been awarded survey work by TechnipFMC to support the development of Coral-Sul FLNG project. The survey work is due to begin in April 2021. The start-up of the project is planned for 2022.

## **[Europe / Russia]**

Fluxys LNG announced on 15 February 2021 that it had taken the final investment decision (FID) to build the additional infrastructure required at the Zeebrugge LNG terminal. 4.7 million tonnes per year from early 2024 and 1.3 million tonnes per year from early 2026 of additional regasification capacity will be provided.

Titan LNG announced on 4 February 2021 that it had agreed with NYK Line to charter the LNG bunker vessel Green Zeebrugge. Previously known as the 'Engie Zeebrugge', NYK renamed the vessel after becoming the sole owner of the vessel. Titan LNG charters the Green Zeebrugge for several years from February 2021. The vessel will be used to supply LNG to larger LNG-fuelled vessels in the Amsterdam-Rotterdam-Antwerp (ARA) region. The Green Zeebrugge is added to the two already operational barges (FlexFueler's 001 and 002). The 8000 m<sup>3</sup> Titan LNG Hyperion is nearing a Final Investment Decision (FID) to be available by early 2023. Titan LNG also said that it would soon supply bio-LNG which could be blended with LNG using existing infrastructure and engine technology. The next step of using green hydrogen to convert into E-Fuels (synthetic LG) is under development for implementation in 2024.

ENGIE and Equinor announced on 18 February 2021 that they had signed a memorandum of understanding (MOU) to investigate the development low-carbon hydrogen value chains in Belgium, the Netherlands and France. The partners will investigate the production and market potential for hydrogen from natural gas whereby the CO<sub>2</sub> will be captured and stored permanently offshore.

INEOS announced on 25 February 2021 that hydrogen would be used in a commercial scale CHP plant at the INEOS Phenol site in Doel. Initially 10% of the gas feed will be replaced by hydrogen. This is the first time that such tests have been carried out on an industrial scale in Belgium. ENGIE is responsible for the design, installation and operation of the technology at the INEOS site.

Air Liquide and Siemens Energy announced on 8 February 2021 a Memorandum of Understanding (MOU) to combine their expertise in PEM (Proton Exchange Membrane) electrolysis technology. They intend to focus their activities on these key areas: co-creation of large industrial-scale hydrogen projects especially in Germany and France.

Total announced on 12 February 2021 that it had inaugurated France's largest filling station dedicated to Natural Gas for Vehicle (NGV) and bioNGV in Gennevilliers, the second largest fluvial port in Europe.

GTT announced on 15 February 2021 that it had obtained two Approvals in Principle (AiP) from Bureau Veritas. The first Approval is related to the « NH<sub>3</sub> Ready » classification of Mark III membrane tanks. The AiP recognizes that the Mark III system is suitable for the

subsequent containment of ammonia in LNG as fuel applications. The second Approval relates to the higher design pressure of "1 barg" in LNG as fuel applications, such as large container vessels.

Hanseatic Energy Hub announced on 22 February 2021 the completion of the non-binding phase of the Open Season with confirmed market interest from global players supporting the full 12 Bcm per year planned capacity of the terminal near the city of Stade in the vicinity of the Port of Hamburg, Germany.

Finland's Gasum announced on 22 February 2021 that it had entered into an agreement with the City of Vaasa, NLC Ferry Oy and Wärtsilä Finland Oy to supply LNG. Gasum is to build a local LNG customer terminal in Vaskiluoto from where tanker trucks will take LNG to customer sites.

Spain's Enagás announced on 23 February 2021 that it was bringing forward its goal of becoming carbon neutral to 2040. The company says it has brought down its emissions by 63.2% between 2014 and 2020. Enagás is already working on 30 hydrogen and 16 biomethane projects.

Spain's Reganosa announced on 22 February 2021 that it would operate and maintain the first LNG terminal in Sardinia (Italy), in the port of Oristano on the west of the island. The Higas facilities are expected to be operational in the first half of 2021, with a jetty capable of receiving LNG vessels up to 20,000 cubic meters, six tanks (1,500 cbm each), two LNG truck loading bays, and a gas-fired power generation system.

Russia's NOVATEK announced on 25 February 2021 that NOVATEK Gas & Power Asia and Shenergy Group signed a long-term LNG Sales and Purchase Agreement (SPA) for the LNG produced from the Arctic LNG 2 project for more than 3 million tonnes over 15 years to be delivered to LNG terminals in China on DES basis.

NOVATEK and Nuovo Pignone (Italy), part of the Baker Hughes Company, signed a Cooperation Agreement aimed at reducing carbon dioxide (CO<sub>2</sub>) emissions. The parties intend to cooperate in developing electrical and gas turbine solutions for natural gas and LNG production, as well as solutions for reducing CO<sub>2</sub> emissions. The parties will commence implementing a project to convert gas turbines to hydrogen-based fuel gas mix.

Kongsberg Maritime announced on 10 February 2021 an equipment contract with NOVATEK where KM will supply electric frequency converter-driven deck machinery for six Ice Class LNG carriers, with an option for a further four. The vessels are to be built by Korea's Daewoo Shipbuilding & Marine Engineering (DSME).

Reference: Company and institution announcements, Cedigaz News Report.

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