

LNG Review February 2022 - Recent issues and events -

Hiroshi Hashimoto*

Introduction

The global gas industry is eager to know what the impact of the military actions ongoing from late February 2022 would be on the gas and LNG markets. What potential physical reductions and disruptions of pipeline gas supply would be; what factors and actors should trigger such physical reductions and disruptions of pipeline gas supply; and what potential impacts on gas prices would be. Where any alternative gas supply - most likely in the form of LNG - would come from.

How small and vulnerable consumers in Europe would react - how much energy they could additionally save during the winter. What the governments could do in addition to measures that have already introduced to protect consumers. How LNG consumers and producers around the world would react to cope with the seasonally, as well as unexpectedly, tighter market conditions.

Economic sanctions naturally have impacts on economic activities. The industry players have been also trying to find out what they could do and could not do to avoid negative impacts on their activities and most importantly their gas and energy customers.

Potential longer-lasting negative impacts have already emerged in the form of explicit intentions to withdraw from gas projects or related investment activities. Such decisions should be carefully considered and evaluated depending on companies' positions and strategies.

Help is on the way from the United States. Venture Global LNG shipped out its inaugural cargo of LNG from the Calcasieu Pass LNG export facility in Cameron, Louisiana, at the beginning of March.

The industry associations in the United States, including LNG Allies, as well as Energy Policy Research Foundation, Inc. (EPRINC), wrote a letter to the country's administration in late February, urging a clear expression that natural gas is a critical part of national security and an important climate solution.

* 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]

Saibu Gas announced on 3 February 2022 that the company has received a 'carbon-neutral LNG' cargo, procured from Tokyo Gas, at its Hibiki LNG terminal on the preceding day.

Mitsui O.S.K. Lines, Ltd. (MOL) announced on 17 February 2022 plans of two cutting-edge LNG-fueled ferries. MOL signed a deal with Naikai Zosen Corporation to build the two ferries. The vessels are slated for delivery in 2025, to operate on MOL Ferry's Oarai-Tomakomai route.

Mitsubishi Shipbuilding Co., Ltd., a part of Mitsubishi Heavy Industries (MHI) Group, and Mitsui O.S.K. Lines, Ltd. (MOL) announced on 3 February 2022 that they had completed a conceptual study on floating storage and regasification unit (FSRU) for ammonia. The two companies and the Kansai Electric Power Co., Inc. have concluded a memorandum of understanding (MOU) to examine the possibilities of future introduction of Ammonia FSRU.

Mitsubishi Shipbuilding announced on 2 February 2022 that it had concluded a contract with Sanyu Kisen Co., Ltd., calling for construction of a demonstration test ship to transport liquefied carbon dioxide (LCO₂) in conjunction with initiatives of the New Energy and Industrial Technology Development Organization (NEDO) in "CCUS R&D and Demonstration Related Project / Large-scale CCUS Demonstration in Tomakomai / Demonstration Project on CO₂ Transportation / R&D and Demonstration Project for CO₂ Marine Transportation". Construction will get underway at the Enoura Plant of MHI's Shimonoseki Shipyard & Machinery Works, with completion and delivery scheduled for the second half of the fiscal 2023. Three additional project partners - Kawasaki Kisen Kaisha, Ltd. ("K" LINE), Nippon Gas Line Co., Ltd., and Ochanomizu University - will accelerate R&D of the LCO₂ transportation technology and contribute to cost reduction of CCUS technology and safe, long-distance and large-scale transportation of LCO₂.

Mitsui O.S.K. Lines, Ltd. (MOL) announced on 8 February 2022 that it had concluded a Memorandum of Understanding (MoU) with Malaysia's PETRONAS to study liquefied CO₂ transportation required for carbon capture, utilization and storage (CCUS) value chain.

JERA announced on 18 February 2022 that it would conduct an international competitive bid for the procurement of fuel ammonia, sending a request for proposals (RFP) to more than 30 companies.

An official at the Ministry of Trade, Industry and Energy said, "Although we are in discussion with Washington and others, we can't afford it as of now as there is already a high demand for gas across the nation this winter," adding that the decision will stay up in the air

until gas demand decreases domestically after the peak season ends.

Australia's BHP announced on 7 February 2022 that it had welcomed MV Mt. Tourmaline - world's first LNG-fuelled Newcastlemax bulk carrier - that will transport iron ore between Western Australia and Asia. BHP has chartered five LNG-fuelled Newcastlemax bulk carriers from Eastern Pacific Shipping (EPS) for five years and awarded the LNG fuel contract to Shell. On her maiden voyage, the vessel arrived at Jurong Port in Singapore for her first LNG bunkering operation which will take place through the first LNG bunker vessel in Singapore, the FueLNG Bellina. FueLNG, a joint venture between Shell Eastern Petroleum and Keppel Offshore & Marine, operates the bunker vessel.

Thailand's PTT announced on 15 February 2022 that the company and Electricity Generating Authority of Thailand (Egat) had signed a joint venture agreement to invest in the second LNG receiving terminal project in Rayong, which is expected to start operation in 2022, as part of the government plan to develop a regional LNG trade hub. The LMPT2 terminal is designed to have capacity of 7.5 million tonnes a year.

JERA announced on 1 March 2022 the start of full-scale operations by JERA Energy Vietnam Co., Ltd. (JERA EV), the subsidiary in Hanoi, Vietnam.

China's National Development and Reform Commission (NDRC) revealed on 16 February 2022 that it had approved Hanas Group's plan to construct a new LNG receiving terminal in Putian, Fujian Province. NDRC revealed on the day that it had approved Guangdong Energy's plan to construct another new LNG receiving terminal in Huizhou, Guangdong Province.

Pakistan's two long-term suppliers defaulted on their agreements to supply two LNG cargoes to Pakistan in March 2022.

Australia's AGL Energy Limited announced on 21 February 2022 that it had rejected an unsolicited, preliminary, non-binding indication of interest from a consortium led by Brookfield Asset Management to acquire 100% of the shares in AGL Energy.

ConocoPhillips announced on 17 February 2022 that it had completed the purchase of an additional 10% shareholding interest in Australia Pacific LNG (APLNG) from Origin Energy. ConocoPhillips owns a 47.5% interest in APLNG, with Origin Energy and Sinopec owning 27.5% and 25% interests, respectively.

According to information on Australia's Industry Department website, Chevron's Gorgon carbon capture and storage (CCS) facility operated at half capacity for the fiscal year from July 2020 to June 2021.

Santos announced on 28 February 2022 that the company, SK E&S, K-CCUS Association, CO2CRC and Korea Trade Insurance Corporation had signed a Memorandum of Understanding (MOU) to support and collaborate in the development of carbon dioxide

(CO₂) storage facilities. The organisations agreed to jointly develop carbon capture and storage (CCS) projects in Australia and the region, including Bayu-Undan in Timor Leste. CCS at Bayu-Undan would have the potential capacity to store 10 million tonnes of carbon dioxide per year.

ExxonMobil announced on 21 February 2022 that Esso PNG P'nyang Limited, Ampolex Limited, and the Independent State of Papua New Guinea had signed the P'nyang project gas agreement for the proposed development of the P'nyang LNG project. The project would deliver LNG by constructing new upstream facilities in Western Province linked to existing infrastructure. The P'nyang field is estimated to have 4.36 trillion cubic feet of gas. The P'nyang development in Western Province is proposed to commence following the Papua LNG project, which will be located in Gulf Province. The P'nyang project will be an independent project with landowner benefits to be provided under a future benefit sharing agreement to be negotiated by the State in accordance with the Oil and Gas Act. The P'nyang project would provide about four years of additional construction activity after Papua LNG. Upon completion, the P'nyang Project would make available up to five percent of gas produced to Western Province or another agreed location to support the government's electrification efforts. The P'nyang field is located within Petroleum Retention License 3. Esso PNG P'nyang Limited, a subsidiary of Exxon Mobil Corporation, operates the license and, together with Ampolex (Papua New Guinea) Limited, has a 49% interest. Affiliates of Santos and JX Nippon have a 38.5% interest and 12.5% interest respectively.

[North America]

The Federal Energy Regulatory Commission (FERC) approved on 17 February 2022 two policy items related to pipeline and LNG export projects. The first policy change (Updated Pipeline Certificate Policy Statement) revamps how FERC determines if there is enough "public need" for a proposed project to justify approval. The second policy (Interim Greenhouse Gas (GHG) Emissions Policy Statement), an interim change that could be revised based on public comments, will create a framework for evaluating a project's likely GHG emissions and effects on climate change. FERC said it will encourage developers to propose plans to mitigate a project's emissions, and it will generally presume a project emitting more than 100,000 tonnes per year of CO₂ equivalent requires a full environmental impact statement.

The American Gas Association (AGA) released on 22 February 2022 the following statement regarding activities on 17 February 2022 at FERC: "FERC's actions today could hinder the ability of utilities and customers, including electric generators, to obtain the natural gas they need to meet their responsibility to serve customers affordably and reliably.

These policy changes could also lead to further delays in the review process which could impact system resilience and impede the delivery of low-carbon fuels such as renewable natural gas and hydrogen using the natural gas delivery system."

27 Senate Republicans sent a letter on 17 February 2022 to DOE to facilitate the increase of LNG exports.

Cheniere Energy announced on 7 February 2022 that Substantial Completion of Train 6 at the Sabine Pass liquefaction project in Cameron Parish, Louisiana (SPL Project) was achieved on 4 February 2022. Commissioning is complete and Cheniere's engineering, procurement and construction partner, Bechtel Oil, Gas and Chemicals, Inc. has turned over care, custody, and control of Train 6 to Cheniere.

Cheniere Energy announced on 24 February 2022 that its subsidiary, Cheniere Corpus Christi Liquefaction Stage III, LLC, had amended the long-term Integrated Production Marketing (IPM) gas supply agreement signed in 2019 with EOG Resources, Inc., extending the term and tripling the volume of LNG associated with the natural gas supply under the long-term IPM transaction. EOG has agreed to sell 420,000 million Btu of natural gas per day to CCL Stage III for a period of 15 years, with one third of the supply targeted to commence upon the completion of each of Trains 1, 4 and 5 of the Corpus Christi Stage III project. The LNG associated with this gas supply, or approximately 2.55 million tonnes per year, will be owned and marketed by Cheniere, and EOG will receive a price based on the Platts Japan Korea Marker (JKM) for this gas. In addition, the previously executed gas supply agreement, under which EOG will sell 300,000 million Btu per day to CCL Stage III at a price indexed to Henry Hub, has been extended to 15 years. As a result, EOG will supply a total of 720,000 million Btu of natural gas per day (4.37 million tonnes per year) to CCL Stage III under the amended agreements for a 15-year period expected to commence upon start-up of the Corpus Christi Stage III project. EOG will continue to sell 140,000 million Btu of natural gas per day to Corpus Christi Liquefaction, LLC, which commenced in 2020, until the commencement of the amended long-term agreements. The LNG associated with the gas supply, or approximately 0.85 million tonnes per year, is owned and marketed by Cheniere, and EOG receives a price based on JKM for this gas. The CCL Stage III project is being developed to include seven mid-scale liquefaction trains with a total expected nominal production capacity of over 10 million tonnes per year.

Tellurian said on 2 February 2022 that the company planned to start construction on its Driftwood LNG plant in Louisiana in April.

Venture Global LNG and JERA announced on 1 March 2022 loading and departure of the first cargo of LNG produced at the Calcasieu Pass LNG export facility in Cameron, Louisiana.

According to the company's DOE filing, on 21 January 2022, Venture Global's Plaquemines LNG executed a Base Contract for Sale and Purchase of Natural Gas with Repsol Energy North America, purchasing around 0.35 million tonnes of LNG equivalent natural gas for three years.

Energy Transfer on 3 February 2022 asked FERC for a 3-year extension to its permit to build its Lake Charles LNG facility through late 2028, according to the company's FERC filing.

ExxonMobil said on 1 March 2022 that it was planning a hydrogen production plant and a large carbon capture and storage (CCS) project at its refining and petrochemical site at Baytown, Texas.

Southern California Gas Co. (SoCalGas) announced on 24 February 2022 that 14 billion cubic feet (0.29 million tonnes) of renewable natural gas (RNG) produced from organic waste was distributed via SoCalGas' pipeline system in 2021, 2 billion cubic feet more than 12 billion cubic feet distributed by SoCalGas in 2020. SoCalGas completed five RNG interconnection projects in 2021. In total there are now nine RNG projects connected to SoCalGas' system. As part of SoCalGas' goal of achieving net zero greenhouse gas (GHG) emissions in its operations and delivery of energy by 2045, the company plans to deliver 20% RNG to core customers by 2030.

Canada's TC Energy subsidiary Coastal GasLink announced that its construction site near the Morice River drill pad site off the Marten Forest Service Road, was assaulted on morning 17 February 2022 by approximately 20 attackers. There were no physical injuries to Coastal GasLink workers.

Pembina Pipeline Corporation announced on 8 February 2022 that its and the Haisla Nation's Cedar LNG export project in Kitimat, British Columbia, had submitted an application for an Environmental Assessment Certificate (EAC) to the British Columbia Environmental Assessment Office, moving the project into the 180-day application review phase. Cedar LNG also announced an agreement with Black & Veatch and Samsung Heavy Industries (SHI) for the front-end engineering and design (FEED) of the proposed floating liquefaction, storage and offloading unit (FLNG). Cedar LNG expects to make a final investment decision in 2023. The expected in-service date is in 2027.

[Middle East]

Qatargas denied on 18 February 2022 recent media reports speculating that Qatargas may be experiencing unplanned shutdowns of two LNG trains. Qatargas said these shutdowns were coordinated with all parts of operations, shipping and customers as part of annual planning exercises. This includes customers around the world.

[Africa]

ENI said on 18 February 2022 that it planned to develop its Congo LNG project to target a start-up in 2023 and full capacity, 2 million tonnes per year, in 2024. New Fortress Energy Inc. (NFE) announced on 28 February 2022 a Heads of Agreement (HoA) with Eni for the deployment of NFE's Fast LNG liquefaction technology off the coast of Congo for 20 years. NFE will deploy its "Fast LNG" facility to produce up to 1.4 million tonnes per year of LNG in the associated gas fields. The production is expected to start in Q2 of 2023.

[Europe / Russia]

Japan's Ministry of Economy, Trade and Industry expressed its willingness to support the European Union to ensure enough gas supply on 9 February 2022.

British Prime Minister told MPs that the government should not be "hitting the energy companies at precisely the moment where we need to encourage them to go for more gas". The Energy Minister said the United Kingdom needs "the North Sea to be part of the energy transition" and stressed that it would be "a mistake" to ignore its important role in "shifting the energy space".

KBR announced on 28 February 2022 that it had been awarded a contract to provide professional services to Shell Global Solutions International B.V. for hydrogen liquefaction development. KBR will provide technical solutions as part of concept studies to advance technology for large scale hydrogen liquefaction.

Shell announced on 15 February 2022 BioLNG had become available to customers in the Netherlands, as a blend with regular LNG. Hereby Shell becomes the first in the Netherlands to offer bio-LNG to all of its customers. After gearing up production Shell plans to offer pure bio-LNG to its entire LNG network in the Netherlands within a few years. Shell supplies bio-LNG from its plant that opened in Amsterdam in autumn 2021 with partners Nordsol and Renewi. Shell has 46 LNG stations in Europe, with the ambition to expand the European network to 80 locations by the end of 2022.

Fluxys announced on 1 February 2022 that Dunkerque LNG was organising a Call for Market Interest process ("Capacity 2023-2036") offering an opportunity to book up to 3.5 bcm per year of regasification capacity with a minimum of 3 years.

Norway's Equinor said on 31 January 2022 that due to continuing consequences from the pandemic and operational restrictions the time of start-up of the Hammerfest LNG plant was pushed from 31 March 2022 to 17 May 2022.

Greece's Gastrade announced on 31 January 2022 that the Final Investment Decision (FID) for the construction of the Independent Natural Gas System (INGS) of

Alexandroupolis was taken on the previous day. The Floating Storage and Regasification Unit (FSRU) will be connected to the National Natural Gas Transmission System of Greece with a 28 km long pipeline, enabling the gasified LNG to be transmitted to the markets of Greece, Bulgaria and the wider region, from Romania, Serbia and North Macedonia, as all the way to Moldova and Ukraine. The Terminal is expected to operate by the end of 2023, with the contracted regasification capacity already reaching up to 50% of its technical capacity of 5.5 bcm per year.

Russia wants to continue supplying the world with gas and LNG, Russian President said at the 6th Gas Exporting Countries Forum (GECF) in Doha. Russia's former president tweeted that the suspension of certification of the Nord Stream 2 pipeline to Germany would mean soaring gas prices - €2.000 for 1.000 cubic meters (USD 50 / million Btu) - in Europe.

Mitsui O.S.K. Lines, Ltd. (MOL) announced on 9 February 2022 that it agreed on 26 January to participate in cargo transport for the Arctic LNG 2 Project on Russia's Gydan Peninsula, and signed a charter contract for a newbuilding ice-breaking tanker with the project company, whose largest shareholder is Russia's NOVATEK. The vessel will be constructed in China and is slated for delivery in 2024. This contract follows the October 2020 signing of charter contracts for three ice-breaking LNG vessels to serve for the same project.

NOVATEK announced on 17 February 2022 that the Arc7 ice-class module carrier AUDAX had completed its voyage along the Northern Sea Route (NSR) long after the traditional navigation season closure, to deliver a process module weighing almost 12,000 tonnes for Arctic LNG 2 from the Chinese port of Tianjin to Murmansk.

Gazprom announced on 25 February 2022 that a Joint Coordinating Committee meeting of Gazprom and CNPC took place via a video link. February 2022 marked the signing of the long-term Sales and Purchase Agreement for natural gas to be supplied via the Eastern route. The amount of Russian pipeline gas supplies to China is going to grow to 48 billion cubic meters per year.

Gazprom announced on 28 February 2022 that the Gazpromvod Soyuz Vostok special-purpose vehicle and Gazprom Proyecktirovaniye signed a contract for design and survey works as part of the Soyuz Vostok gas pipeline construction project. The trunkline will become an extension of Russia's Power of Siberia 2 gas pipeline.

Shell announced on 28 February 2022 its intention to exit its joint ventures with Gazprom and related entities, including its 27.5% stake in the Sakhalin-2 LNG facility. Shell also intends to end its involvement in the Nord Stream 2 pipeline project. ExxonMobil announced on 1 March 2022 that it would discontinue operations at Sakhalin-1 and make no new investments in Russia.

[Global issues]

Published on 3 February 2022 in the journal *Science*, the study *Chasing after methane's ultra-emitters* details about 1,200 such ultra-emitters detected by satellite between 2019 and 2020, referring to events involving at least 25 metric tons of methane leaks per hour. The study focused on six major producing countries, including the United States, and found they accounted for the majority of ultra-emitters that were identified. Central Asia's Turkmenistan had the highest number, followed by Russia, the United States, Iran, Kazakhstan and Algeria. The research, however, did not include the United States' Permian Basin because of overlapping plumes from the region's closely located facilities.

IEA released on 23 February 2022 *Global Methane Tracker*. According to the report, global methane emissions from the energy sector are about 70% greater than the amount national governments have officially reported. The energy sector accounts for around 40% of methane emissions from human activity. Methane emissions from the energy sector grew by just under 5% in 2021. In 2021, significant emissions were confirmed in Texas and parts of Central Asia, with Turkmenistan responsible for one-third of large emissions events seen by satellites in 2021. The announcement also said that of the five countries with the largest methane emissions from their energy sectors - China, Russia, the United States, Iran and India - only the United States is part of the Global Methane Pledge.

Contact: report@tky.ieej.or.jp