

LNG Review July 2021 - Recent issues and events -

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Introduction

The upward trend of the global gas prices being apparent since the second quarter of 2021 was reinforced in July to realise the USD 15s of the assessed spot LNG prices in Northeast Asia, the USD 14s of European spot gas prices (TTF and NBP) and around USD 4 of Henry Hub in the United States, all per million Btu, by the end of the month.

The biggest driver of the high price trend has been the firm LNG demand in Northeast Asia, notably in China, which also contributed to the 4% growth of the global LNG trade in the first half of the year to 190 million tonnes.

Japan's LNG import in the first half of the year amounted to 38.89 million tonnes, increasing by 7% or 2.5 million tonnes year-on-year, driven by the incremental LNG procurement early in the year to take care of extra electric power demand. China's LNG import increased even faster, by 28% year-on-year, to 39.78 million tonnes, making the country the biggest LNG importer during the period. The corresponding U.S. dollar denominated payments by the two countries were USD 16 billion from China and USD 17 billion from Japan.

On the other hand, European LNG import (including Turkey and the United Kingdom) in the same period decreased by 20% year-on-year to 40 million tonnes, after steadily increasing during the previous two years.

While Australia, Qatar, and Russia exported almost same volumes as one year earlier, the United States exported 33 million tonnes of LNG during the first half of 2021, increasing by nearly 40%, effectively meeting all increases in the global demand as it did in 2020. The U.S. Energy Information Administration (EIA), in its latest monthly (July) Short-Term Energy Outlook, revised up its LNG export outlooks to 73 million tonnes for 2021 and 77 million tonnes, or the equivalent to the world largest LNG exporting country status, for 2022.

The global LNG market witnessed more carbon-neutral LNG and carbon/GHG-offset LNG deal announcements lately. In early July 2021, Japan's Osaka Gas and INPEX, respectively, announced their first carbon-neutral LNG cargo arrangements. Shell and PetroChina announced the industry-first term

* 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.

contract for carbon-neutral LNG. In the middle of the month, bp and Sempra announced their first carbon-offset LNG cargo delivery between them.

[Asia Pacific]

Osaka Gas announced on 6 July 2021 that it had received a cargo of carbon neutral LNG at its Senboku terminal delivered from Brunei under a contract with Shell.

Saibu Gas received the first large-scale cargo from Novatek's Yamal LNG project in Russia on an ice-class tanker at the Hibiki terminal on 18 July 2021, Saibu Gas announced on the next day. The LNG is for reload/transshipment business for overseas customers.

JFE Steel Corporation announced on 20 July 2021 that it had signed long-term deals with NYK Line, Kawasaki Kisen Kaisha and Mitsui O.S.K. Lines to charter three LNG-fuelled bulk carriers. The ships, which have been designed by Nihon Shipyard and will be built by Japan Marine United and Imabari Shipbuilding, are scheduled to be completed successively from the beginning of 2024.

Bechtel announced on 6 July 2021 that Delta Offshore Energy (DOE) had awarded Bechtel a contract to provide Front End Engineering Design (FEED) services for a 3,200 MW combined cycle gas turbine (CCGT) power plant in the Bạc Liêu province, approximately 250 km south of Ho Chi Minh City in Southern Vietnam. In parallel DOE is conducting FEED for the offshore receiving terminal, negotiating the terms of the Power Purchase Agreement with Vietnam Electricity Authority and implementing site preparation works.

According to preliminary data from NDRC, China's natural gas consumption during the first half of 2021 was 182.7 bcm, an increase of 17.4% year-on-year. During the first half of 2021 China produced 104.5 bcm, 10.9% more than the same period of 2020.

Shell announced on 12 July 2021 that the company and PetroChina had signed a five-year agreement for carbon-neutral LNG. PetroChina on the day received its first carbon-neutral LNG cargo at Dalian port of China, after signing the industry's first term contract for carbon-neutral LNG supply with Shell.

Guangzhou Gas and bp announced on 9 July 2021 that it had signed an SPA for 0.65 million tonnes per year of LNG starting in 2022 through 2034.

Sinopec (China Petroleum & Chemical Corporation) announced on 6 July 2021 that it had initiated China's first megaton carbon capture, utilization and storage (CCUS) project, the Sinopec Qilu-Shengli Oilfield CCUS, expected to be put into operation by the end of 2021.

China's NDRC released on 15 July 2021 the draft Management Measures for the Operation and Dispatch of Natural Gas Pipeline Network Facilities and Emergency Supply Guarantee aiming at promotion of reform of natural gas pipeline network operation mechanism and guarantee national energy security.

Norway's Crown LNG announced on 5 July 2021 that it had concluded an agreement with Aker Solutions as the main contractor to deliver a gravity-based structure (GBS) in concrete for Crown's offshore LNG terminal at Kakinada, India. Siemens Energy and Wärtsilä Gas Solutions have been assigned as key subcontractors to Aker Solutions. Crown LNG has an exclusive agreement to finance, build and lease to its client KGLNG, a subsidiary of East LNG. KGLNG has the license to establish the LNG receiving terminal at Kakinada.

The governments of Bangladesh and Malaysia signed a Memorandum of Understanding (MoU) on cooperation in supply of LNG. PETRONAS LNG Ltd and Global LNG Sdn Bhd of Malaysia and Bangladesh Oil, Gas and Mineral Corporation (PETROBANGLA) of Bangladesh are the designated entities in supplying the LNG.

New Fortress Energy (NFE) announced on 8 July 2021 that it had signed a Framework Agreement with the Government of Sri Lanka to construct a new offshore LNG receiving, storage and regasification terminal. The terminal will be located off the coast of Colombo to supply gas to the country's power plants, primarily located in the Kerawalapitiya Power Complex. The complex consists of 300 MW in operation and is expected to grow to over 1,000 MW by 2025. NFE will supply natural gas to the existing 300 MW Yugadanavi Power Plant and is negotiating the purchase of the Government's 40% stake in the company that owns the power plant. The power plant is under a long-term power purchase agreement (PPA) to provide electricity to the national grid that extends through 2035. The terminal will introduce natural gas to the country of Sri Lanka for the first time. The terminal is expected to begin operations by the second half of 2022.

TotalEnergies announced on 13 July 2021 that it had completed a transaction with GIP Australia (GIP) in relation to the downstream facilities of the GLNG Project, with effective date 1 January 2021. GIP will receive a throughput-based tolling fee calculated on TGA's share of gas processed through the downstream facilities over 15 years.

Chevron announced on 2 July 2021 that the company and the Gorgon participants would proceed with the Jansz-Io Compression (J-IC) project. J-IC is positioned to maintain gas supply from the Jansz-Io field to the three existing LNG trains and domestic gas plant on Barrow Island, the company said. Construction activities are estimated to take five years. J-IC follows the Gorgon Stage 2 project, which is nearing completion of the installation phase, to supply gas to the Gorgon plant from four new Jansz-Io and seven new Gorgon wells.

Chevron announced on 19 July 2021 that it was poised to reach a milestone at its Gorgon LNG facility, injecting five million tonnes of greenhouse gas (carbon dioxide equivalent, CO₂e) since starting the system in August 2019. Once fully operational, the system will capture up to 4 million tonnes of CO₂ annually and reduce greenhouse gas emissions by more than 100 million tonnes over the life of the injection project. Yet Chevron

said it had not met injection requirements as it had taken more time to safely start the system. Chevron intends to make up the shortfall and will report publicly on that later in the year.

In the company's second quarter 2021 report on 15 July 2021, Woodside said it had launched the sell-down processes for Scarborough and Pluto Train 2. The company said it was targeting a sell-down of up to 49% of Pluto Train 2 and was testing the market for value accretive opportunities to reduce Woodside's equity interest in the Scarborough resource. The timing of the sale processes is aligned with the targeted FID in H2 2021.

INPEX CORPORATION announced on 10 July 2021 that it had made arrangements to offtake carbon-neutral LNG from the Ichthys LNG Project, and received the shipment of carbon-neutral LNG at its Naoetsu LNG terminal in Joetsu City in Niigata Prefecture, Japan. The shipment marks INPEX's first offtake of carbon-neutral LNG. The carbon footprint of the shipment was offset using carbon credits in an arrangement with TotalEnergies SE.

Australia's InterContinental Energy announced on 13 July 2021 that an international consortium comprised of the company, CWP Global and Mirning Green Energy Limited was implementing an integrated green fuels mega project in the Southeast of Western Australia. The Western Green Energy Hub (WGEH) could produce up to 50 gigawatts of hybrid wind and solar power over 15,000-square-kilometres. WGEH will be built in phases to produce up to 3.5 million tonnes of zero-carbon green hydrogen or 20 million tonnes of green ammonia per year.

Malaysia's PETRONAS announced on 7 July 2021 that PETRONAS LNG Limited (PLL) had secured a 2.2 million tonnes per year, 10-year term deal to supply LNG to CNOOC Gas and Power Trading & Marketing Limited, a subsidiary of China National Offshore Oil Corporation (CNOOC). The agreement includes supply from LNG Canada when the facility commences its operations by middle of the decade. The deal is indexed to a combination of the Brent and AECO indices.

PETRONAS announced on 7 July 2021 that it had conducted the first LNG Bunkering operation via its LNG Bunker Vessel (LBV) - MV Avenir Advantage - at the Pintu Gedung anchorage, Port Klang, Malaysia. MV Solar Roma, a Liberian Tanker en route to the Mediterranean was supplied 865 m³ of LNG sourced from the PETRONAS Energy and Gas Trading business in less than 12 hours upon its arrival at the anchorage.

[North America]

Cheniere Energy announced on 15 July 2021 that its subsidiary, Corpus Christi Liquefaction Stage III, LLC had entered into a long-term gas supply agreement (GSA) with a marketing subsidiary of Tourmaline Oil Corporation, the largest natural gas producer in Canada. Tourmaline has agreed to sell 140,000 million Btu per day of natural gas to Corpus

Christi Stage III for a term of 15 years from early 2023. The LNG associated with this gas supply, approximately 0.85 million tonnes per year, will be marketed by Cheniere under the Integrated Production Marketing (IPM) transaction. Cheniere will pay Tourmaline an LNG-linked price for its gas, based on JKM.

Dominion Energy and Berkshire Hathaway Energy announced on 12 July 2021 that they had agreed to terminate the planned sale of Questar Pipelines to Berkshire Hathaway Energy. The decision is a result of ongoing uncertainty associated with achieving clearance from the Federal Trade Commission (FTC) under the Hart-Scott-Rodino Antitrust Improvements Act of 1976. Dominion Energy is commencing a competitive process for the sale of Questar Pipelines, with a target close of year-end 2021.

PGNiG (Polish Oil and Gas Company) and Sempra announced on 27 July 2021 that they had terminated the sale and purchase agreement (SPA) that provided for 2 million tonnes per year of LNG supply from the Port Arthur LNG project. The decision was made due to delays in the project's development. The two companies signed a Memorandum of Understanding (MoU) for a potential replacement of approximately 2 million tonnes per year of LNG from other Sempra LNG's portfolio of projects in North America. As part of the MOU, the two companies are also working toward a framework for the reporting, mitigation and reduction of greenhouse gas (GHG) emissions throughout the LNG value chain, Sempra said.

PGNiG announced on 27 July 2021 that it had signed agreements with Venture Global Calcasieu Pass, LLC and Venture Global Plaquemines, LLC to purchase another 2 million tonnes per year of LNG for 20 years. The volume of LNG contracted from Venture Global LNG by PGNiG is to increase to 5.5 million tonnes per year - 1.5 from the under-construction Calcasieu Pass facility and 4 from the planned Plaquemines project, respectively, on an FOB basis. The first delivery from Calcasieu Pass is expected in early 2023.

Tellurian announced on 29 July 2021 that it had finalized LNG sale and purchase agreements (SPAs) with Shell. The SPAs are on a free on board (FOB) basis at Driftwood LNG for a combination of 3 million tonnes per year for a 10-year period, indexed to a combination of JKM and TTF, each netted back for transportation charges. The agreements mark the third deal that Tellurian has finalized in ten weeks, for a total of 9 million tonnes per year and nearly all of the capacity of Driftwood LNG's first two plants. Tellurian said on 12 July that it had terminated a stock and LNG purchase agreement with TotalEnergies related to the project.

Kinder Morgan, Inc. (KMI) announced on 16 July 2021 that it had agreed to acquire Indianapolis-based Kinetrex Energy from an affiliate of Parallel49 Equity. Kinetrex is the leading supplier of LNG in the Midwest and a rapidly growing player in producing and supplying renewable natural gas (RNG) under long-term contracts to transportation service

providers. Kinetrex has a 50% interest in the largest RNG facility in Indiana as well as signed commercial agreements to begin construction on three additional landfill-based RNG facilities. Once operational in 2022, total annual RNG production from the four sites is estimated to be over four billion cubic feet. The transaction is expected to close in the third quarter of 2021.

Mountain Valley Pipeline, LLC announced on 12 July 2021 plans that would make it one of the first interstate natural gas transmission pipelines to acquire carbon offsets for its operational emissions. Mountain Valley would purchase carbon offsets to make MVP's operational emissions carbon neutral for the first 10 years of service. These Scope 1 and Scope 2 emissions include carbon dioxide from engines used to drive compressor stations; methane released during operation; and maintenance of the pipeline, as well as carbon dioxide resulting from generation of purchased electricity, MVP said.

ExxonMobil announced on 30 July 2021 estimated the second-quarter earnings of USD 4.7 billion compared with a loss of USD 1.1 billion in the second quarter of 2020. Chevron reported earnings of USD 3.1 billion for the second quarter 2021, compared with a loss of USD 8.3 billion in second quarter 2020.

The U.S. Department of Energy's Office of Fossil Energy (DOE/FE) said on 2 July 2021 that it would prepare a supplemental environmental impact statement (SEIS) for the Alaska LNG project under development by state-owned Alaska Gasline Development Corporation (AGDC). The SEIS will include analysis of potential environmental impacts associated with natural gas production on the North Slope of Alaska and a life cycle analysis (LCA) calculating the greenhouse gas (GHG) emissions for LNG exported from the project.

LNG Canada expressed in its construction update on 27 July 2021 concern over the Coastal GasLink (CGL) pipeline's suggested increase of cost estimates and extra time to complete. TC Energy said on 29 July 2021 that Coastal GasLink was in dispute with LNG Canada with respect to the recognition of certain costs and the impacts on schedule. TC Energy said if a resolution was not reached in the near term, Coastal GasLink might be required to suspend certain key construction activities.

The Nisga'a Nation, Rockies LNG and Western LNG announced on 19 July 2021 the filing of the Initial Project Description for the Ksi Lisims LNG project with the Government of British Columbia and the Government of Canada. Ksi Lisims LNG is a proposed 12-million-tonne-per-year LNG project at Wil Milit on the northern tip of Pearse Island near the Nisga'a village of Gingolx.

Pieridae Energy Limited announced on 2 July 2021 that the company failed to meet all of the key conditions necessary by 30 June to make a final investment decision (FID) on the Goldboro LNG Project. The company will assess options and analyze strategic

alternatives that could make an LNG project more compatible with the current environment. In addition, the company will continue its work to further optimize the operation and development of its Foothills resources and midstream assets, including the carbon capture and sequestration and blue power development.

GHGSat announced on 7 July 2021 a new research project to assess the feasibility of its high-resolution, space-based methane monitoring technology to measure emissions from offshore oil and gas platforms. Chevron, Shell, and TotalEnergies are supporting the 12-month research project.

New Fortress Energy (NFE) announced on 14 July 2021 that its LNG terminal in the port of Pichilingue, Baja California Sur, Mexico had begun commercial operations. The Terminal features NFE's proprietary ISOFlex system, which allows larger LNG carrier vessels to transload LNG into ISO storage containers on offshore support vessels (OSVs) with a specialized manifold. Under an agreement signed in March 2021, NFE will supply natural gas to power plants in Baja California Sur through the terminal. NFE has also nearly completed construction of its own gas-fired power plant in Baja California Sur with a capacity of approximately 135 megawatts that is anticipated to begin operations and the supply of power to the local grid later in the third quarter. The terminal's truck loading operations were designed for the supply of LNG to local hotels and industrial customers.

bp and Sempra announced on 16 July 2021 that they had entered into a contract for the delivery and receipt of the companies' first carbon offset LNG cargo. The cargo is expected to be delivered to the Energía Costa Azul (ECA) terminal in Mexico on 16 July and it will be sourced from bp's global LNG portfolio. Carbon dioxide (CO₂) and methane (CH₄) emissions associated with the LNG cargo, from wellhead to discharge terminal, will be estimated using bp's GHG quantification methodology for LNG. The methodology has been developed following relevant international standards and may be updated from time to time. These estimated emissions will be offset by retiring a corresponding amount of carbon credits, sourced from a Mexican afforestation project from bp's portfolio of offsets on behalf of Sempra LNG.

[Middle East]

INPEX CORPORATION, JERA and the Japan Oil, Gas and Metals National Corporation (JOGMEC) had signed a joint study agreement with the Abu Dhabi National Oil Company (ADNOC) on exploring the commercial potential of a clean ammonia production business in the United Arab Emirates (UAE), the four parties announced on 8 July 2021. The parties will explore the potential of producing and transporting clean ammonia to Japan. The clean ammonia with reduced carbon footprint will be produced in Abu Dhabi from natural

gas-derived hydrogen, where most of the CO₂ emitted from the production of ammonia will be sequestered and utilized in enhanced oil recovery (CO₂EOR) operations at Abu Dhabi onshore oil fields in which INPEX has a participating interest.

Korea's Ministry of Trade, Industry and Energy (MOTIE) announced on 12 July 2021 that Korea Gas Corporation (Kogas) and Qatar Petroleum (QP) had signed an LNG sales and purchase contract for 2 million tonnes per year of LNG 2025 to 2044.

QP announced on 7 July 2021 that it had concluded a 15-year LNG Sale and Purchase Agreement (SPA) with CPC Corporation, Taiwan, for 1.25 million tonnes per year of LNG commencing in January 2022.

Kuwait Integrated Petroleum Industries Company (KIPIC) announced it had received its first LNG shipment at Al-Zour import terminal. The shipment arrived from Qatar.

[Africa]

Sound Energy announced on 29 July 2021 that it had signed a 10-year LNG sales and purchase agreement (SPA) with Morocco's largest liquid petroleum gas distributor Afriquia Gaz from Sound Energy's proposed Tendrara gas project onshore Morocco.

Eni announced on 8 July 2021 an agreement with the Egyptian Electricity Holding Company (EEHC) and the Egyptian Natural Gas Holding Company (EGAS) to assess the feasibility of producing hydrogen in the country. The parties will conduct a study into projects to produce green hydrogen, using electricity generated from renewables, and blue hydrogen, through the storage of CO₂ in depleted natural gas fields.

Golar LNG Limited announced on 20 July 2021 that it had agreed with Perenco Cameroon and Société Nationale des Hydrocarbures (SNH) to increase utilisation of the FLNG Hilli Episeyo. From 2022 the capacity utilisation of Hilli will increase by 200,000 tonnes of LNG, bringing total utilisation in 2022 to 1.4 million tonnes. The tolling fee for the 2022 incremental capacity is linked to European gas prices at the Dutch Title Transfer Facility (TTF). Perenco and SNH also intend to drill and appraise 2 to 3 incremental natural gas wells during 2021, and subsequently upgrade upstream facilities in 2022 to support further sustained increases in production from 2023 onward. Perenco and SNH are granted an option to increase capacity utilisation of Hilli by up to 400,000 tonnes of LNG per year from January 2023 through to the end of the current contract term in 2026. This has the potential to increase total annual LNG production from Hilli to 1.6 million tonnes from January 2023 onwards.

Kosmos Energy revealed on 6 July 2021 in its operational update on its activities that due to cost inflation and supplier delays together with some scope growth in Mauritania and Senegal the Greater Tortue Ahmeyim project partners were updating estimates, with first

gas now expected in the third quarter of 2023.

[Europe / Russia]

bp and EnBW announced on 19 July 2021 that they had submitted their bid for offshore wind acreage in the ScotWind leasing round. The consortium has applied for a lease area off the east coast of Scotland that could support offshore wind projects with 2.9 gigawatts (GW) generating capacity.

Seaspan Corporation announced on 6 July 2021 that it had concluded long-term charters with ZIM Integrated Shipping Services of ten ultra-modern 7,000 TEU dual-fuel LNG containership newbuilds. The containerships are anticipated to be delivered in the fourth quarter of 2023 and through 2024.

TotalEnergies and Technip Energies announced on 21 July 2021 that they had signed a Technical Cooperation Agreement to develop low-carbon solutions for LNG production and offshore facilities to accelerate the energy transition.

Russia's Yamal LNG announced on 2 July 2021 the scheduled maintenance of the first LNG train with a shutdown from 1 to 19 August. The regular maintenance is carried out in accordance with the approved annual schedule and will not affect the planned LNG production volume for the year, the company said.

[South America]

New Fortress Energy (NFE) announced on 6 July 2021 that it had reached an agreement for LNG supply that will cover the remaining volumes for NFE's existing natural gas and electricity businesses across the Caribbean, Mexico and Central America through the end of 2027. The company expects commercial operations to begin within days in Mexico and in August 2021 in Nicaragua, as well as later in the year in Brazil. The company anticipates securing additional LNG supply volumes later in 2021 to support NFE's four terminals in Brazil, which are all expected to be operational in 2022.

[Global issues]

The International Gas Union (IGU) released on 8 July 2021 its 2021 Wholesale Gas Price Survey Report. According to the survey there has been a long-term trend toward market-based pricing for natural gas as gas on gas pricing represented 49.3% in 2020, rising from 31.3% in 2005.

Reference: Company announcements, Cedigaz News Report.

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