

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

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### **Introduction**

Assessed spot LNG prices in Northeast Asia have been steady due to the strong demand for LNG in the region, along with unplanned outages at some LNG production facilities and steady spot gas prices in Europe. The Assessed spot LNG prices in Northeast Asia have been the highest of the past seven years (2015-2021) since the middle of April.

Europe's volumes of imports of Russian pipeline gas (that were to some extent limited) and unseasonably cold weather in April pushing European storage levels down to multi-year lows, as well as strengthening economics of coal-to-gas switching, combined with, as mentioned above, demand for LNG restocking in Northeast Asia and China's coal-to-gas switching have made gas prices firm.

LNG imports by the big four markets in Northeast Asia (Japan, Korea, China and Chinese Taipei) in the first four months of 2021 increased by 13% year-on-year to 77.30 million tonnes. Monthly LNG imports into the four markets combined increased year-on-year in each month of the four-month period. China's cumulative import of LNG during the first four months of 2021 increased by 29.6% year-on-year to reach 26.2 million tonnes. China's natural gas consumption during the first four months of 2021 was 122.01 bcm, an increase of 16.8% year-on-year.

In the LNG production project development front, initiatives to address GHG emissions have been more apparent. In the United States, Venture Global LNG announced in late May 2021 plans to capture and sequester carbon at its Calcasieu Pass (under construction) and planned Plaquemines LNG facilities. NOVATEK and TotalEnergies, partners of the Arctic LNG 2 project in Northern Russia, announced in early June that they had signed a Memorandum of Understanding (MOU) on decarbonization, hydrogen and renewables.

During the Japan-EU Summit meeting in late May, the Japan - EU Green Alliance was adopted, in which the two sides confirmed recognition that natural gas will play an important role during the energy and climate transition.

\* 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]**

JERA announced on 11 May 2021 that it had concluded a Memorandum of Understanding (MOU) with Yara International ASA, a world leader in the production of nitrogen fertilizer, related to cooperation in the ammonia value chain business, including development of a blue ammonia production plant. JERA and Yara have agreed to pursue potential collaboration in the following areas: Improvements to the Yara Pilbara Fertilizer plant in Australia to enable the production of blue ammonia; Joint development of new blue and green ammonia production projects; Optimization of ammonia shipping; and supply and development of new demand for ammonia in Japan including in power generation.

JERA and IHI Corporation announced on 24 May 2021 that they had received notice of acceptance of their joint grant application to conduct a demonstration project under the New Energy and Industrial Technology Development Organization's "Development of Technologies for Carbon Recycling and Next-Generation Thermal Power Generation / Research, Development and Demonstration of Technologies for Ammonia Co-Firing Thermal Power Generation" program. The project aims to establish ammonia co-firing technology at a coal-fired power plant. The project will run from June 2021 to March 2025. The companies plan to demonstrate an ammonia co-firing rate of 20% at Unit 4 (1 GW) of JERA's Hekinan Thermal Power Station in FY 2024.

The city authority of Yokohama announced on 28 May 2021 that NYK Cruises, NYK Line, Ecobunker Shipping Co. and the city had signed a Memorandum of Understanding to develop LNG bunkering facilities for cruise ships at the Port of Yokohama in Japan.

Mitsui O.S.K. Lines (MOL) announced on 18 May 2021 that it had decided to re-enter the ammonia transport business with the Green Pioneer, a 35,000 cbm-type ammonia /LPG carrier, and signed a time charter contract with Trammo, an ammonia trading company.

Japan Petroleum Exploration Co., Ltd. (JAPEX) announced on 13 May 2021 "JAPEX2050: Toward a Carbon-Neutral Society", which sets forth JAPEX's direction as a comprehensive energy company" in light of worldwide calls for a decarbonized society.

GSE Systems, Inc. and ABB Bailey Japan announced on 24 May 2021 a project to provide process simulation for NIHONKAI LNG Niigata terminal, Japan. The project covers software and services scope which will include modelling processes using JPro Tools, a simulation software from GSE, which will then be integrated with ABB's automation system.

INPEX and Nihonkai Gas announced on 31 May 2021 that they had entered into a carbon neutral gas sales and purchase agreement. The carbon neutrality is based on carbon credits certified by a credible certifier as deriving from CO2 reduction efforts at forest conservation projects, etc. based around the world where greenhouse gas emissions have been offset throughout the entire value chain process from development to combustion.

Korea Gas Corporation (Kogas) announced on 6 May 2021 that its LNG bunkering subsidiary, Korea LNG Bunkering Co., Ltd., had conducted a ship-to-ship (STS) LNG bunkering operation at the Samsung Heavy Industries (SHI) shipyard in Geoje, Gyeongnam. 'SM JEJU LNG 2', the first LNG bunkering vessel in Asia, loaded an 180,000 m<sup>3</sup> LNG carrier (shipowner: GASLOG, Greece) with 4,400 m<sup>3</sup> (about 2,000 tonnes) of LNG, after gas replacement and cooling.

Kogas announced on 28 May 2021 that the company and GS Caltex had signed a memorandum of understanding (MoU) for liquid hydrogen production utilising cryogenic energy of LNG. A liquid hydrogen station with a production capacity of 10,000 tonnes per year will supply liquid hydrogen to the Seoul metropolitan area and the country's central region in the future. Hydrogen will be extracted from LNG, converted into liquid hydrogen and stored by utilising cryogenic energy of LNG. The companies have also decided to review the construction of hydrogen extraction facilities and the demonstration and commercialization of carbon capture and utilisation (CCU) technologies.

Daewoo Shipbuilding and Marine Engineering (DSME) announced on 28 May 2021 that it had won an order for the construction of a 174,000 m<sup>3</sup> LNG carrier from Hyundai LNG Shipping, to be built at the Okpo Shipyard. Its delivery is scheduled by the fourth quarter of 2023. The vessel is planned for a long-term charter contract with Repsol.

FueLNG, MPA (Maritime and Port Authority of Singapore), Keppel Offshore & Marine (Keppel O&M) and Shell announced on 7 May 2021 that FueLNG had completed Singapore's first bunkering of an LNG-fuelled oil tanker. FueLNG is a joint venture between Keppel O&M and Shell Eastern Petroleum (Pte) Ltd. FueLNG completed the gas-up and cool down operation for the LNG-powered oil tanker 'Pacific Emerald', including the transfer of 3,000 m<sup>3</sup> of LNG from FueLNG Bellina, Singapore's first LNG bunkering vessel, to the tanker. Pacific Emerald is the first of 10 newbuild Aframax tankers chartered by Shell Tankers Singapore (Private) Limited from Sinokor Petrochemical Co Limited.

Mitsui O.S.K. Lines, Ltd. (MOL) announced on 17 May 2021 that the company, ITOCHU Corporation, ITOCHU ENEX, Vopak, Pavilion Energy and Total Marine Fuels had signed a memorandum of understanding (MOU) with regarding the joint development study on ammonia fuel supply chain in Singapore.

Total announced on 26 May 2021 that cash distributions by MGTC (Moattama Gas Transportation Company Limited) to its shareholders (Total (31.24%), Chevron (28.26%), PTTEP (25.5%) and MOGE (15%)) had been suspended. MGTC gas transportation system carries the gas produced from the Yadana field operated by Total Exploration & Production Myanmar to the Myanmar/Thailand border over a distance of 400 kilometers.

Myanmar Investment Commission (MIC) announced on 7 May 2021 that it had

approved fifteen new projects for electricity generation, livestock, manufacturing and other services sectors, including an LNG-to-power project.

Stena Power & LNG Solutions announced on 18 May 2021 that it had been awarded a contract by Delta Offshore Energy (DOE) to provide front-end engineering design (FEED) for usage of Stena's jettyless LNG transfer and regasification solutions. DOE will employ Stena's Jettyless Floating Terminal (JFT) and Self-installing Regas Platform (SRP) to supply fuel to the 3.2 GW power project in the Bạc Liêu province, Vietnam. According to local reports, Millennium Energy Corporation will invest in an LNG receiving terminal and power generation facilities in the Vân Phong Economic Zone in Khánh Hòa province.

Shell announced on 20 May 2021 that Shell Petroleum N.V. had signed an agreement with Malampaya Energy XP Pte Ltd (a subsidiary of Udenna Corporation), for the sale of its 100% shareholding in Shell Philippines Exploration B.V. (SPEX). SPEX holds a 45% operating interest in Service Contract 38 (SC38), which includes the producing Malampaya gas field. The transaction is targeted to complete by the end of 2021. The other partners in SC38 are UC38 LLC, a subsidiary of Udenna Corporation (45%), and Philippine National Oil Company Exploration Corporation (10%).

According to preliminary data from NDRC, China's natural gas consumption during the first four months of 2021 was 122.01 bcm, an increase of 16.8% year-on-year. According to China's Customs Statistics, the country imported 6.73 million tonnes of LNG, an increase of 33.6% year-on-year, in April 2021. China's cumulative import of LNG during the first four months of the year increased by 29.6% year-on-year to reach 26.2 million tonnes.

GTT announced on 24 May that it had received an order from China Huanqiu Contracting & Engineering Co. Ltd. (HQC) for the design of four very large Membrane Full Containment LNG storage tanks. The order is part of the new cooperation agreement related to the Tianjin Nangang LNG terminal, signed in March between BGG and GTT. The tanks will be delivered in the third quarter of 2023 in the Tianjin south port Industrial Zone.

Beijing Gas Group posted a notice on the Shanghai Petroleum and Natural Gas Exchange on 31 May 2021 to invite expressions of interest for supply of LNG from 2023 to 2032. Potential suppliers are required to submit their interest by 21 July 2021.

According to Monthly Report on Natural Gas, April 2021, published by India's PPAC (Petroleum Planning & Analysis Cell, Ministry of Petroleum & Natural Gas), the country's gross production of natural gas in April was 2.651 bcm, an increase of 22.7% year-on-year. The country's import of LNG in the month was 2.655 bcm, an increase of 45.2%. Total consumption in the month was 4.859 bcm, also an increase of 24% year-on-year. The country's natural gas consumption during the first four months of the year was 19.1 bcm, increasing by 8.7% year-on-year.

Total announced on 20 May that the company and ArcelorMittal Nippon Steel (AMNS) had signed an agreement for the supply of up to 500,000 tonnes of LNG per year until 2026. The LNG will be sourced from Total's global portfolio and offloaded either at the Dahej or the Hazira LNG Terminal, on the West Coast of India. AMNS will use the LNG to run its steel and power plants located in Hazira, Gujarat state.

Pakistan LNG Limited (PLL) announced on 29 May 2021 that it had invited bids for the supply of nine LNG cargoes of 140,000 cubic meters each for delivery from 08 July to 28 August with the bidding deadline of 2 June. Pakistan's Oil & Gas Regulatory Authority (Ogra) has awarded a 'gas-marketing licence' to Shell Energy Pakistan (Pvt) Limited.

Woodside, IHI and Marubeni announced on 20 May that the companies had signed a Heads of Agreement to investigate the production and export of green ammonia produced from renewable hydro power in Tasmania. Initially, green ammonia would be produced at a small-scale hydrogen electrolysis plant. Woodside is exploring options for production in the Bell Bay region in northeast Tasmania. The capacity of the proposed plant could eventually be scaled up to as much as 250 MW to produce green hydrogen as feedstock for green ammonia exports.

Australian Gas Infrastructure Group (AGIG) announced on 19 May that its Australian Gas Networks (AGN) had opened its hydrogen production facility Hydrogen Park South Australia (HyP SA) and commenced blending renewable hydrogen into part of its natural gas distribution network in Adelaide, South Australia.

Australia's Edify announced on 25 May that in South West NSW a battery project is being developed by Edify. Located in the Murrumbidgee Shire, the Riverina Energy Storage System (RESS) is to be a 100MW / 200MWh lithium-ion battery that will connect into TransGrid's network. RESS is being developed to meet the requirements of Shell Energy and the NSW Government, with Shell Energy signing a long-term services agreement to access operational rights to a 60MW / 120MWh partition of the battery.

Venice Energy announced on 5 May that it had finalised selection of a preferred supplier of a Floating Storage and Regasification Unit (FSRU) for its Outer Harbor Project in Adelaide. The company launched its FSRU tender in December 2020. Three detailed offers were short-listed in early March 2021. The company has signed the Heads of Agreement and Term Sheet with a leading global independent LNG shipowner and operator from Europe.

Woodside announced on 27 May 2021 that the company plans supply of 50 MW of solar energy to the Woodside-operated Pluto LNG facility on Western Australia's Burrup Peninsula. The solar power would be supplied from the proposed Woodside Power Project. Woodside and Perdaman have announced their intentions to evaluate the supply of a further 50 MW of solar power from the Woodside Power Project to Perdaman's proposed urea facility.

WA Kaolin Ltd announced on 26 May 2021 that it had signed a 15-year contract for the supply of LNG for the Wickepin Kaolin Project, with Mid-West LNG Pty Ltd, (MWLNG) a group company of Clean Energy Fuels Australia (CEFA). The LNG will be used to fire the rotary kiln that dries the kaolin ore. MWLNG is in the process of building a new LNG plant in Mount Magnet and WAK will be the second customer supplied from this new facility. The Mount Magnet LNG Hub is expected to have capacity of 500 tonnes per day of LNG. The contract will commence in January 2022 and will run for 15 years.

JGC Holdings Corporation announced on 10 May 2021 that a lawsuit was filed against the company's joint venture JKC AUSTRALIA LNG PTY Ltd. (JV) with KBR and Chiyoda Corporation by ICHTHYS LNG PTY Ltd.

INPEX announced on 24 May an agreement with the Future Energy Exports Cooperative Research Centre (FEnEx CRC) - an industry partner of research and development of new technologies that will seek lower the cost and carbon emissions of energy production in Australia. The partnership with FEnEx CRC involves research funding of AUD 1.5 million, supporting studies on efficiency of LNG production value chains, digital technologies, and new hydrogen energy and export to market, the company said.

Santos and Eni announced on 3 May that they had signed a Memorandum of Understanding (MOU) to cooperate on opportunities in northern Australia and Timor-Leste. The areas of cooperation include assessing the synergies of sharing possible infrastructures associated with gas field developments around Barossa and Evans Shoal, pipeline to Darwin and onshore associated gas processing leading to LNG expansion developments. This also includes investigating options to re-purpose the Bayu-Undan facilities to extend the life of the project, including a carbon capture and storage project, subject to the agreement of the Timor-Leste government. Other areas of cooperation include the possible development of Petrel and Tern through Blacktip/Yelcherr gas plant facilities.

Santos, as operator of the Bayu-Undan Joint Venture, announced on 25 May the Phase 3C infill drilling program had commenced at the Bayu-Undan field, in Timor-Leste offshore waters. The program, given a Final Investment Decision (FID) in January, comprises of three production wells, extending field life as well as production from the offshore facilities and the Darwin LNG plant.

PETRONAS announced on 7 May that PETRONAS LNG Ltd (PLL) had introduced the Canada AECO index as a new LNG price indexation to its customers following the sale of a spot LNG cargo from Bintulu, Malaysia, to a buyer in Asia for August delivery.

PTT Exploration and Production Public Company Limited (PTTEP) announced on 19 May another gas discovery from its first exploration well, Kulintang-1, in Block SK438, located off the coast of Sarawak, offshore Malaysia. The location provides an advantage for

future development including the potential for cluster development, the company said. PTTEP is the operator with 80% participating interest while PETRONAS Carigali holds the remaining 20%. PTTEP is also a joint investor with PTT, through the PTT Global LNG Company, in the MLNG Train 9 Project in Sarawak.

Total announced on 5 May that the Government of Papua New Guinea (PNG) and Total as Operator had remobilized the Papua LNG project teams. The objective is to prepare for final investment decision (FID) in 2023. The project will target the production of the two main discoveries of Block PRL-15, Elk and Antelope. It is expected that the gas produced by these fields will be transported by a 320 km onshore/offshore pipeline to Caution Bay site in order to be liquefied in 2 trains to be built with a total capacity of 5.6 million tonnes per year which will be integrated to the existing PNG LNG facilities. Total operates the Elk and Antelope onshore fields and is the largest shareholder of the PRL-15 permit with a 31.1% interest, alongside partners ExxonMobil (28.7%) and Oil Search (17.7%), post the State back-in right of 22.5%.

### **[North America]**

U.S. Secretary of Energy said on 28 May 2021 that the administration wanted to be able to promote and sell clean technologies including decarbonized natural gas. The Department of Energy (DOE) announced on 23 April a Joint Statement on Establishing a Net-Zero Producers Forum between the Energy Ministries of Canada, Norway, Qatar, Saudi Arabia, and the United States.

Based on data from DOE (Department of Energy), the United States exported 6.60 million tonnes of LNG in March, the most ever in one month. Sabine Pass exported 35 cargoes amounting to 2.37 million tonnes.

According to the company's first-quarter 10-Q report to SEC (UNITED STATES SECURITIES AND EXCHANGE COMMISSION) Cheniere Energy's Sabine Pass LNG Train 6 is 83% complete and is expected to be completed by the first half of 2022. Engineering is 99.6% complete, procurement 99.9%, and construction 61.7%.

Cheniere Energy announced on 4 May 2021 that Sabine Pass Liquefaction, LLC had supplied a carbon neutral cargo of LNG to Shell as part of the companies' long-term LNG Sale and Purchase Agreement. Cheniere and Shell worked together to offset the full lifecycle greenhouse gas (GHG) emissions associated with the LNG cargo by retiring nature-based offsets to account for the estimated CO<sub>2e</sub> emissions produced through the entire value chain, from production through use by the final consumer (all scopes3). The cargo was delivered to Europe in early April. Offsets used were bought from Shell's global portfolio of nature-based projects with Cheniere purchasing the portion attributable to estimated CO<sub>2e</sub> emissions

associated with activities upstream of the FOB delivery point.

GTI announced on 27 May that Queen Mary University London, with support from the Collaboratory to Advance Methane Science (CAMS) and Spain's Enagás SA, had conducted a first-of-its-kind study to directly measure methane emissions of an operating LNG vessel. Data was collected aboard the Cheniere-chartered newbuild GasLog Galveston during a round-trip voyage from Cheniere's Corpus Christi liquefaction facility to Europe, including measurements of engine exhaust as well as fugitive emissions.

Sempra Energy said during its Q1 Earnings Call on 5 May that it was more likely that final investment decision (FID) at Port Arthur LNG would move to 2022 as the company worked on options to reduce the projects' greenhouse gas profile, to improve its competitive position in the global energy transition and to cope with the continued impacts of the pandemic on the global energy markets.

Tellurian and Gunvor announced on 27 May 2021 an LNG sales and purchase agreement (SPA) for 3 million tonnes per year for ten years, indexed to a combination of two indices; the Japan Korea Marker (JKM) and the Dutch Title Transfer Facility (TTF), netted back for transportation charges. Tellurian also announced on 3 June that it had finalized another LNG sales and purchase agreement (SPA) with Vitol for 3 million tonnes per year for 10 years, indexed to JKM and TTF, netted back for transportation charges. The LNG under the two deals would be delivered free on board (FOB) from Tellurian's Driftwood LNG.

Venture Global LNG announced on 27 May plans to capture and sequester carbon at its Calcasieu Pass (under construction) and planned Plaquemines LNG facilities. Venture Global claimed the company would capture and sequester an estimated 500,000 tonnes of carbon per year from the two sites. The company anticipates using similar infrastructure to capture and sequester 500,000 tonnes of carbon per year from the CP2 LNG facility once permitted. The deployment of carbon capture and sequestration technology at Calcasieu Pass would be the first of its kind for an existing LNG facility in the United States.

Pivotal LNG announced on 6 May that the JAX LNG facility located along the St. John's River in Jacksonville, Florida, was expanding its capacity - tripling liquefaction to 360,000 gallons per day (0.224 million tonnes per year) and doubling LNG storage to 4 million gallons (6,813 tonnes). The expansion is expected to be placed in service by early 2022. JAX LNG began operations in 2018 and is a joint venture between Pivotal LNG (Pivotal), a BHE GT&S company, and NorthStar Midstream (NorthStar). Construction of the liquefaction expansion is underway led by Salof Ltd. For the storage expansion, JAX LNG is working with Matrix Service Company, a leader in small- to mid-size LNG liquefaction and storage terminals. Matrix completed the roof lift of the new 2-million-gallon storage tank in December 2020. In 2019, NorthStar formed Polaris New Energy (Polaris), an LNG marine



transportation company. Polaris is constructing a new 5400 m<sup>3</sup> LNG bunker barge with Fincantieri Bay and an integrated tug with Master Boat Builders.

G2 Net-Zero LNG announced on 6 May 2021 that NET Power and G2 Net-Zero LNG had executed a new Letter of Intent following a pre-FEED (Front End Engineering Design) report. G2 said that its Net-Zero LNG export facility would be the first to integrate NET Power's Allam-Fetvedt Cycle technology which removes all CO<sub>2</sub> emissions from the natural gas liquefaction process. G2 Net-Zero LNG also said it was building the world's first LNG export and industrial gas production complex with net-zero carbon emissions from upstream to dockside by as early as 2027. In advance of Net-Zero LNG production, G2 plans to produce industrial gases, including argon, nitrogen and oxygen, and capturing all CO<sub>2</sub> emissions.

GAC Bunker Fuels Limited announced on 4 May 2021 that Puget LNG, LLC and GAC Bunker Fuels had signed a Memorandum of Understanding (MOU) to cooperate in the supply and sale of LNG marine fuel from Puget LNG's terminal to GAC's customers in the Pacific Northwest. When the Tacoma LNG Terminal becomes operational in the second quarter, it will be the first such terminal on North America's west coast providing direct shoreside loading access for a bunker barge.

The Port of Corpus Christi Authority announced on 4 May that it and Stabilis Solutions Inc. had entered into a Memorandum of Understanding (MOU) to facilitate the use of LNG as a marine fuel at the port. With the partnership and the increasing availability of LNG, the parties hope to attract more LNG-capable vessels and to encourage the conversions to LNG power. The parties have committed to providing extensive customer education and technical support as well as attracting capital. The port will provide suitable access to dock space for shore-to-ship fuelling operations while Stabilis will deploy its existing fleet of mobile cryogenic assets (including LNG transportation and distribution equipment) from its LNG production plant in South Texas to support LNG fuelling operations.

Stabilis Solutions announced on 1 June that it had completed the acquisition of an LNG production facility in Port Allen, Louisiana from HR Nu Blu Energy. Built in 2018, the facility has nameplate production capacity of 30,000 LNG gallons (48 tonnes) per day which increases Stabilis' total nameplate production capacity by approximately 30%.

Chevron announced on 11 May that its subsidiary is investing an additional USD 20 million in the Adopt-a-Port initiative with California renewable natural gas (RNG) provider Clean Energy Fuels Corporation. Chevron has invested USD 28 million in the initiative, which provides truck operators serving the ports of Los Angeles and Long Beach with RNG.

ExxonMobil announced on 26 May that based on preliminary vote estimates, shareholders had elected eight of ExxonMobil nominees to the board of directors and two of Engine No. 1 nominees. ExxonMobil on 2 June updated the results, as shareholders are

expected to elect nine ExxonMobil nominees and three Engine No. 1 nominees.

According to the company's first-quarter 10-Q report to SEC (UNITED STATES SECURITIES AND EXCHANGE COMMISSION), New Fortress Energy Inc. is developing an LNG regasification facility and power plant each at the Port of Pichilingue in Baja California Sur, Mexico ("La Paz Facility") and in Puerto Sandino, Nicaragua ("Puerto Sandino Facility"), respectively. Initially, the La Paz Facility is expected to supply approximately 270,000 gallons of LNG per day (0.158 million tonnes per year) for approximately 100 MW of power. In Puerto Sandino, the company is constructing a 300 MW power plant that will consume approximately 700,000 gallons of LNG per day (0.407 million tonnes per year).

Kinder Morgan, Inc. announced on 1 June that it had agreed to acquire Stagecoach Gas Services LLC, a natural gas pipeline and storage joint venture between Consolidated Edison and Crestwood Equity Partners LP. Stagecoach consists of 4 natural gas storage facilities with a total FERC-certificated working gas capacity of 41 billion cubic feet (0.853 million tonnes) and 185 miles (298 km) of natural gas pipelines with multiple interconnects to major interstate natural gas pipelines, including Tennessee Gas Pipeline (TGP), a KMI subsidiary. The transaction is expected to close in the third quarter of 2021.

Equitrans Midstream Corporation said on 4 May in its financial and operational results for the first quarter 2021 that Mountain Valley Pipeline (MVP) JV is targeting a full in-service date during the summer of 2022.

Southwestern Energy announced on 2 June 2021 a definitive merger agreement with Haynesville producer Indigo Natural Resources. The transaction is expected to close early in the fourth quarter of 2021.

EQT Corporation announced on 6 May that it had entered into a purchase agreement with Alta Resources Development, LLC (Alta), pursuant to which EQT will acquire all of the membership interests in Alta's upstream and midstream subsidiaries.

EQT announced on 15 April its commitment to seek independent certification of a majority of its produced natural gas under certification standards developed by Equitable Origin and MiQ. It is anticipated that certification will be obtained later in the year. EQT plans to obtain Equitable Origin and MiQ certification of the natural gas produced from over 200 of its well pads located in Greene and Washington Counties, Pennsylvania, which collectively produce approximately 4.0 Bcf/day from the wellhead (gross volume). These certifications will expand EQT's growing portfolio of certified natural gas, sometimes referred to as responsibly sourced gas, having previously announced in January a separate project with Project Canary to certify gas produced from two of its well pads, also located in southwestern Pennsylvania. According to the announcement, when its certification project with Equitable Origin and MiQ is completed, EQT's certified natural gas production will

comprise 4.5% of all natural gas produced in the United States. Equitable Origin and MiQ will oversee an independent, third-party audited assessment of EQT's natural gas production from the selected well pads focusing on environmental, social and governance (ESG) performance, including methane emissions.

Xcel Energy announced on 12 May that it would purchase certified low-emission intensity natural gas produced by Crestone Peak Resources for use in its Colorado operations. Xcel Energy was the first major power producer in the United States to announce its vision to deliver 100% carbon-free electricity by 2050. To meet certified RSG (responsibly sourced gas) requirements, Denver-based Crestone Peak Resources will utilize Project Canary's independent, real-time methane emissions monitors and TrustWell™ certification process.

AVANGRID confirmed on 11 May 2021 that the U.S. Bureau of Ocean Energy Management (BOEM) had issued its Record of Decision (ROD) for Vineyard Wind 1 of 800 MW in New England off the coast of Martha's Vineyard, the first commercial-scale offshore wind project in the United States.

RWE Renewables and National Grid announced on 20 May 2021 the signing of a partnership agreement to develop offshore wind projects in the coastal region of the Northeast United States.

In the middle of May 2021, a resolution seeking to decommission the Aliso Canyon natural gas storage facility was approved by the Los Angeles City Council.

Woodfibre LNG, Pacific Oil & Gas Limited's (PO&G) subsidiary, announced on 6 May that the company had signed a second LNG Sales and Purchase Agreement (SPA) with BP Gas Marketing Limited (BPGM) for LNG from the export facility near Squamish, British Columbia. BPGM will receive 0.75 million tonnes per year of LNG over 15 years on a free on board (FOB) basis. The latest SPA will increase BPGM's total LNG offtake to 1.5 million tonnes per year, over 70% of Woodfibre LNG's future annual production.

Japan Petroleum Exploration Co., Ltd. (JAPEX) announced on 13 May that the company had decided to sell 10% of all ownership interest in the North Montney Joint Venture which undertakes the shale gas project in the North Montney area of British Columbia, Canada, to Petronas Energy Canada Ltd. (PECL), the operator of the project.

Woodside announced on 18 May that it had decided to exit its 50% non-operated participating interest in the proposed Kitimat LNG (KLNG) development, located in British Columbia, Canada. The exit will include the divestment or wind-up and restoration of assets, leases and agreements covering the 480 km Pacific Trail Pipeline route and the site for the proposed LNG facility at Bish Cove. Woodside will retain a position in the Liard Basin upstream gas resource with a low-cost option to investigate potential future natural gas, ammonia and hydrogen opportunities in British Columbia. Chevron announced its plan to

divest its 50% interest in KLNG in December 2019.

Pieridae Energy announced on 27 May 2021 the creation of the Caroline Carbon Capture Power Complex to be located at the company's Caroline Facility in Alberta, combining carbon capture and sequestration and blue power production. The complex is expected to have the ability to sequester up to 3 million tonnes of CO<sub>2</sub> per year into one of the Caroline Facility's depleted gas reservoirs. This amount of carbon captured equals the annual emissions from the Goldboro LNG Facility. Phase 1 of the complex will sequester 1 million tonnes of CO<sub>2</sub> per year and produce approximately 200 MW or 1.9 billion kWh of blue power per year.

Pembina Pipeline Corporation and Inter Pipeline Limited announced on 1 June 2021 that they had entered into an arrangement agreement for Pembina to acquire Inter Pipeline. The transaction will create one of the largest energy infrastructure companies in Canada, with an integrated asset base of natural gas, natural gas liquids and crude oil, from wellhead to end user.

Canada's GNL Québec and the Hanseatic Energy Hub announced on 3 June 2021 that they had launched a strategic partnership on "low-GHG emission" LNG exports from Canada to Germany. The parties have agreed to develop standards and processes for importing LNG from LNG Québec's Énergie Saguenay carbon-neutral export plant in Canada to the Hanseatic Energy Hub's carbon-neutral regasification terminal in Stade, near Hamburg, Germany.

New Fortress Energy (NFE) announced on 25 May that the company had filed a petition for review with the United States Court of Appeals for the District of Columbia Circuit related to the LNG facility in Puerto Rico. The Federal Energy Regulatory Commission (FERC) in March determined that the facility is subject to the commission's jurisdiction under the Natural Gas Act, on which NFE requested a rehearing from FERC and was denied.

### **[Middle East]**

Abu Dhabi National Oil Company (ADNOC) announced on 24 May 2021 that it would advance a "blue" ammonia production facility in Ruwais, Abu Dhabi, in the United Arab Emirates (UAE). The facility, which has moved to the design phase, will be developed at the new TA'ZIZ industrial ecosystem and chemicals hub in Ruwais. The capacity will be 1 million tonnes per year. ADNOC was already a major producer of hydrogen and ammonia, with over 300,000 tonnes of hydrogen produced per year at the Ruwais Industrial Complex, it said. Design contracts have been awarded for the initial Front-End Engineering and Design (Pre-FEED) work for the ammonia project and the six additional TA'ZIZ chemicals projects to Wood. In parallel ADNOC will undertake a feasibility study on the supply of blue hydrogen

to the project from its operations in Ruwais. The final investment decision for the project is expected in 2022, and start-up is targeted for 2025.

### **[Africa]**

Predator Gas Ventures Morocco Branch (PGVMB) announced on 24 May 2021 that PGVMB was submitting a response to the notice of 26 April issued by Morocco's Department of Energy and Mines in Morocco: "Call for expressions of interest in the Construction and operation of a FSRU" to import LNG.

Equinor and Algeria's Sonatrach announced on 18 May that the companies had signed a memorandum of understanding (MoU) to examine cooperation within oil and gas exploration and production in Algeria and internationally. The MoU also includes cooperation within greenhouse gas emissions and carbon management, industrial safety management, implementation of technology to increase hydrocarbon recovery and development of a model for driving high-performance oil operations. Sonatrach and Sinopec announced on 20 May that the companies had signed a Protocol of Agreement and a Memorandum of Understanding. The Protocol of Agreement aims to strengthen the partnership on the Zarzaitine oil field area located in Illizi basin. The Memorandum of Understanding (MOU) was signed to expand their partnership on oil and gas exploration and production projects, and search for new opportunities in the field of LNG and petrochemicals in Algeria and other countries.

Nigeria's Department of Petroleum Resources (DPR) expressed its support to the Nigeria's first floating LNG production plant at the online contract signing of the pre-front end engineering design (Pre-Feed) agreement between UTM Offshore Limited and JGC Corporation (UK) Limited on 11 May. UTM also signed a contract with KBR Engineering Company for the third-party review of the Pre-Feed deliverables from JGC. The project is expected to be completed in 2025. The plant would be processing 176 mcf (1.34 million tonnes per year) natural gas and condensate.

bp and Eni announced on 19 May 2021 that the companies had entered into a non-binding memorandum of understanding (MoU) to progress detailed discussions on combining their upstream portfolios in Angola.

Kosmos Energy said on 10 May in its First Quarter Results announcement that the Phase one of the Greater Tortue Ahmeyim LNG project in Mauritania and Senegal ended the quarter around 58% complete with material progress across all of the major workstreams, including the FPSO, Floating LNG vessel, hub terminal (concrete breakwater) and subsea infrastructure. Petrofac announced on the day that it had secured a contract with bp to develop operational procedures for the Greater Tortue Ahmeyim (GTA) project.

Sasol announced on 14 May that its Sasol South Africa (SSA) subsidiary had concluded a sale and purchase agreement (SPA), to sell a 30% equity interest in the Republic of Mozambique Pipeline Company (ROMPCO). ROMPCO is a joint venture between SSA (50%), Companhia Mocambiçana de Gasoduto S.A. S.A.R.L (CMG) (25%) and South African Gas Development Company (SOC) Limited (iGas) (25%). ROMPCO owns the 865 kilometre gas transmission pipeline from Mozambique to South Africa. SSA has agreed to sell the 30% interest in ROMPCO to an acquisition vehicle beneficially owned by a consortium comprising Reatile Group Proprietary Limited and the IDEAS Fund, managed by African Infrastructure Investment Managers Proprietary Limited. SSA will retain a 20% shareholding in ROMPCO and will continue to operate and maintain the pipeline.

### **[Europe / Russia]**

During the Japan-EU Summit meeting in late May 2021, the Japan - EU Green Alliance was adopted.

The Florence School of Regulation announced on 18 May that a new European Commission project, LNGnet, will launch on 25 May with the objective to facilitate the development of a liquid, flexible and transparent global LNG market.

SSE Thermal and Equinor unveiled on 11 May plans to develop a new low-carbon power station at Peterhead, which could become one of the United Kingdom's first power stations equipped with carbon capture technology. Peterhead CCS Power Station is planned to be a new 900 MW gas-fired power station fitted with carbon capture technology. By capturing up to 1.5 million tonnes (MT) of CO<sub>2</sub> each year, the new station alone would achieve 15% of the United Kingdom Government's target to capture 10 MT of CO<sub>2</sub> annually by 2030. The new station could come online by 2026.

Eni and Progressive Energy Limited announced on 27 May the signing of a framework agreement to further accelerate carbon capture and storage (CCS) within the HyNet North West low carbon cluster project. Eni will develop and operate both the onshore and offshore transportation and storage of CO<sub>2</sub> in their Liverpool Bay assets, whilst Progressive Energy will lead and coordinate the capture and hydrogen aspects.

India's cryogenic technology company INOXCVA announced on 31 May that the company had commissioned United Kingdom's first ever multifunctional mini LNG terminal in Kyleakin, Scotland for MOWI Scotland, under supervision of consultancy firm Fuelgarden. MOWI is one of world's leading seafood company and also the largest Atlantic salmon farmer in the world. INOXCVA supplied the terminal on turnkey basis which includes two 1000 m<sup>3</sup> Vacuum Insulated Storage Tanks, Ship Bunkering Station, 300 m Vacuum Jacketed Piping, Trailer Loading Station and vaporization system. The terminal is capable to take LNG

through small ship as well as by Semi-Trailer & IMO Container.

Shell said on 26 May that it would appeal a Dutch court rule ordering the company to cut its CO<sub>2</sub> emissions 45% from 2019 levels by 2030 as the court ruled that the company was partially responsible for climate change.

NYK announced on 13 May 2021 that the methanol tanker ship Takaroa Sun, owned by NYK subsidiary NYK Bulkship (Asia) participated in the world's first barge-to-ship bunkering of methanol fuel. The bunkering of methanol fuel was conducted in Rotterdam port under the leadership of the charterer Waterfront Shipping Company Limited, together with the cooperation of the Port of Rotterdam, Royal Vopak N.V., and TankMatch B.V.

Titan LNG announced on 3 May the development tender of a new LNG bunkering barge, Titan Krios, to increase LNG fuelling capacity in the Port of Zeebrugge and in the English Channel ports. The new vessel will operate with multiple tanks to segregate streams of LNG and bio-LNG. Krios is a compact seagoing LNG bunker vessel having 4,200 m<sup>3</sup> in capacity. The delivery is expected 2023.

Fluxys announced on 20 May 2021 that a total of 4 additional truck loading bays would be built at the Zeebrugge LNG terminal, scheduled to become available in 2024.

Elengy announced on 17 May that after detecting leak on the insulating joint in the gas pipe linking the Montoir LNG terminal to the transmission grid the company had informed the competent authorities. The company said it decided to stop send-out into the transmission grid on 4 May. The company is working to restart send out as soon as possible.

Total announced on 3 May that it had realized the first ship-to-containership LNG bunkering operation in France. Total's LNG bunker vessel Gas Agility completed on 30 April refuelling of the CMA CGM JACQUES SAADE with 16,400 m<sup>3</sup> of LNG at the Port of Dunkirk.

Total announced on 26 May the acquisition of a 20% stake in Hysetco, a company dedicated to the development of hydrogen mobility. Hysetco owns the largest fleet of hydrogen taxis in the world, launched in 2015 and operated in the Île-de-France region under the Hype brand, as well as hydrogen stations. The other shareholders include STEP (Société du Taxi Electrique Parisien), Air Liquide, Toyota and Kouros.

Total announced on 28 May 2021 that the company's shareholders had approved the resolution to change the company's name to TotalEnergies.

ZEELINK, a joint project of Open Grid Europe GmbH (75%) and Thyssengas GmbH (25%), announced on 6 May that the 216 km long ZEELINK pipeline had been put into operation. The changeover from L-gas (low calorific gas) to H-gas (high calorific gas) is necessary due to decreasing production from the Groningen field in the Netherlands. ZEELINK ensures that new H-gas volumes from north, south and west can be connected, including the Zeebrugge LNG terminal.

Germany's Finance and Environment Ministers announced a new legislative proposal on 5 May to make the country climate neutral by 2045, a week after Germany's Constitutional Court declared the targets set in the 2019 climate protection law were unconstitutional. The new proposal include: Slash emissions by 65% by 2030 compared to 1990 levels; Reach 88% reduction in emissions by 2040; and Achieve climate neutrality by 2045, five years earlier than the previous target.

Equinor announced on 6 May 2021 that the company and Vårgrønn had signed a collaboration agreement to develop floating offshore wind at Utsira Nord west off Utsira and Haugalandet in the Norwegian North Sea. Vårgrønn is a renewable energy company established by HitecVision and Eni.

Horisont Energi and Equinor announced on 19 May 2021 that they had entered into an agreement to further mature the carbon transportation and storage project Polaris, off the coast of Northern Norway. The Polaris carbon storage is expected to have a total carbon storage capacity in excess of 100 million tonnes. The offshore carbon storage reservoir is a key part of the planned Barents Blue project, which will be Europe's first world-scale carbon neutral ammonia production plant. If developed, Barents Blue will have a production capacity of 3000 tonnes of ammonia per day. In its first phase, the facility will convert natural gas from the Barents South region to carbon neutral blue ammonia. Currently at the end of the feasibility phase and soon entering the concept phase, an investment decision for Polaris and the Barents Blue project is expected towards the end of 2022.

Norway's Gasnor announced on 14 May 2021 that it had completed LNG bunkering of Nordlaks' newbuild LNG/battery hybrid fish carrier Bjørg Pauline.

Wärtsilä announced on 26 May that it would supply a biogas liquefaction plant to Norway-based Biokraft, a subsidiary of the Scandinavian Biogas Group. The 25 tonnes per day capacity plant will extend an existing bioLNG production plant at Skogn in Norway, also supplied by Wärtsilä, to a combined total of 50 tonnes per day. The Wärtsilä equipment is scheduled for delivery in May 2022.

American Bureau of Shipping, A.P. Møller - Mærsk, MAN Energy Solutions, Mitsubishi Heavy Industries, NYK Line, Seaspan Corporation and Total announced on 12 May 2021 that they would assess the technical, financial and environmental potential of converting existing vessels to zero carbon fuels through the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping. The project will assess potential conversion from conventional fuel oil, or integration with more recent fuels such LNG and LPG, to enable pathways with future solutions such as Ammonia or Methanol as well as the application of onboard Carbon Capture and Storage.

Maersk Drilling announced on 17 May that it had sold the jack-up rig Maersk



Guardian (now named Guardian) to New Fortress Energy (NFE), and the parties had also entered into an agreement on sale of the jack-up rig Mærsk Gallant. NFE will use the rigs for non-drilling purposes as part of their planned Fast LNG project.

Ørsted announced on 17 May that it had started construction on the H2RES project in Copenhagen. The project is Ørsted's first renewable hydrogen project. H2RES will have a capacity of 2 MW. The facility will produce up to around 1,000 kg of renewable hydrogen a day. The project is expected to produce its first hydrogen in late 2021.

Iberdrola and Mitsubishi Power announced on 20 May that they had signed a collaboration agreement to develop competitive, clean and safe energy solutions based on renewable energy that promote the decarbonization of industrial production around the world. The alliance will develop green hydrogen production facilities, battery storage systems and electrified heat production facilities.

Eni released "Eni for 2020", its 15th voluntary sustainability report. It says decarbonisation of the company's energy products and operations will be achieved through existing activities and technologies. They will lead to a doubling of bio-refining capacity over the next four years; an increase in the production and marketing of biomethane and hydrogen; and a growth in renewable energy capacity to 60 GW by 2050, as well as the development of initiatives and systems for the storage and use of CO<sub>2</sub>.

Italy's Snam announced on 19 May 2021 that the world's first test of a 30% natural gas/hydrogen blend in the forging processes used in industrial steelmaking was held in Rho (province of Milan), at the Forgiatura A. Vienna plant.

Equinor announced on 5 May that the company had agreed to buy 100% of the shares in Polish onshore renewables developer Wento from the private equity firm Enterprise Investors. Wento's business plan includes 1.6 GW of solar power capacity in different stages of development. Equinor announced on 4 May that Poland's Energy Regulatory Office (ERO) had awarded Equinor and Polenergia's Bałtyk II and Bałtyk III projects contracts for difference (CfD) under the first phase of Poland's offshore wind development scheme. The projects, with a combined potential capacity of 1440 MW, are among the first to secure offshore wind awards in Poland. Pending all necessary agreements and permits, and subject to the final investment decision from Equinor and Polenergia, construction work could commence as early as 2024.

In its Investor Day Presentation on 29 April 2021 Russia's Gazprom revealed that 13% of the company's gas exports to Europe were priced off oil in 2020, down from 16.5% the year before. More than 80% of the volumes delivered had a direct link to different trading hubs indexes, it said. Gazprom announced on 11 May 2021 that its Board of Directors had approved the Sustainable Development Policy of the Group.

Gazprom announced on 21 May that construction had begun on the Complex for processing ethane-containing gas (CPECG) near the settlement of Ust-Luga in the Leningrad Region. The CPECG will consist of two major enterprises. The first is the integrated complex for natural gas processing and liquefaction (operated by RusKhimAlyans, a joint venture of Gazprom and RusGazDobycha). The second is the gas chemical complex (operated by Baltic Chemical Complex, a subsidiary of RusGazDobycha). The GPC will have gas processing capacity of 45 bcm per year, and liquefaction capacity of 13 million tonnes of LNG per year. The gas remaining after the processing will go into Gazprom's gas transmission system in the amount of approximately 18 billion cubic meters per year. Ethane fraction will be supplied to the GCC which will have a capacity of over 3 million tonnes of polymers per year.

Gazprom Neft announced on 28 May that Russia's first ship designed to run on LNG and fuel other vessels with LNG had completed its sea trials.

NOVATEK announced on 2 June that NOVATEK Gas & Power Asia and China's Zhejiang Energy Gas Group signed a Heads of Agreement (HOA) for long-term supply of LNG from the Arctic LNG 2 project for annual supply of up to 1 million tonnes for 15 years on a DES basis. On the same day NOVATEK announced that NOVATEK Gas & Power Asia and Glencore signed a Heads of Agreement (HOA) for long-term supply of LNG from the Arctic LNG 2 project for in excess of 0.5 million tonnes of LNG per year.

NOVATEK and TotalEnergies announced on 3 June that they had signed a Memorandum of Understanding (MOU) on decarbonization, hydrogen and renewables. The companies expressed their intention to cooperate on reducing greenhouse gas emission at joint projects with carbon capture and storage technologies and utilizing renewable energy sources at joint LNG projects. In addition, the MOU considers the production and usage of hydrogen as a low-carbon fuel, as well as the marketing of carbon-neutral products including LNG. Specifically, technical solutions will be considered to improve the efficiency of power generation for LNG production, including using waste heat utilization technologies. The MOU also envisages technologies to convert gas turbine equipment to hydrogen fuel. The companies also agreed to work on solutions for the construction of wind power generation facilities and other renewable energy sources to reduce the carbon footprint of LNG projects. On the same day, the two companies announced a Share Purchase Agreement on the sale to the latter of a 10% participation interest in Arctic Transshipment LLC. Arctic Transshipment LLC is NOVATEK's subsidiary that will operate two LNG transshipment complexes currently under construction in the Kamchatka and Murmansk regions.

Wärtsilä announced on 31 May that it would supply the Inert Gas Generator (IGG) systems, as well as the latest technology in radio and integrated navigation systems for six new LNG Carrier vessels being built to serve the Arctic LNG 2 project in Russia.

In an open letter of 19 May to the French, German and Italian governments, 39 lawmakers of the European Parliament urged the governments to stop supporting the Arctic LNG 2 project.

NOVATEK announced on 3 June that it and Fortum signed a Memorandum of Understanding (MOU) on cooperation in renewable power. The MOU envisages that NOVATEK, including the Cryogas-Vysotsk LNG project in particular, will purchase electricity produced by Fortum's renewable power facilities in Russia. Using green energy produced by wind farms owned by Fortum and its joint ventures at the Company's LNG plant in Vysotsk will enable NOVATEK to offer its LNG customers a more sustainable product with a reduced Scope 2 carbon footprint (purchased electricity), NOVATEK said.

NOVATEK announced on 4 June that the company and the Leningrad Region had signed a Cooperation Agreement covering social and economic development in the region. The company's Cryogas-Vysotsk LNG plant and Ust-Luga Gas Condensate Fractionation and Transshipment Complex are located in the region. On the same day, NOVATEK also announced that the company and Severstal had signed a Memorandum of Understanding (MOU) on cooperation in the field of alternative and hydrogen energy to reduce greenhouse gas emissions. The MOU provides for the implementation of a joint pilot project to produce "blue" hydrogen from natural gas and by using technologies for carbon capture and storage.

NOVATEK announced on 4 June that the company, PJSC Sberbank, and Gazprombank signed a Memorandum of Understanding (MOU) on financing the construction of a gas chemical plant on the Yamal peninsula. The parties intend to organize financing to construct a gas chemical plant near Sabetta to produce low-carbon ammonia, hydrogen, as well as other gas chemistry products that reduce greenhouse gas emissions. On the same day, NOVATEK also announced that the company and PJSC Sberbank had signed a Memorandum of Understanding (MOU) to cooperate in the field of ESG.

NOVATEK announced on 4 June that the company and Gazprom Neft had concluded a transaction on NOVATEK's acquisition of a 49% participation interest in Gazpromneft Sakhalin owning a geological survey, exploration and production license for the North-Vrangelievskiy license area.

Gazprom announced on 27 May that 261 km out of 803.4 km section between Kovyktinskoye and Chayandinskoye fields of Power of Siberia gas pipeline had been built. The company said that the Kovyktinskoye field would be connected to the line in late 2022.

### **[South America]**

Excelerate Energy announced on 2 June 2021 that the company's floating storage and regasification unit (FSRU) Exemplar had begun operations in Bahía Blanca, Argentina.

Equinor announced on 1 June that the company (operator), ExxonMobil, Petrogal Brasil and Pré-sal Petróleo SA (PPSA) had decided to develop phase one of the Bacalhau field in the Brazilian pre-salt Santos area. It is the first greenfield development by an international operator in the pre-salt area.

Invenergy and BW LNG announced on 12 May that they had closed a financial package with IDB Invest to finance the floating storage and regasification unit (FSRU) component of the Energía del Pacífico (EDP) LNG-to-power project in El Salvador. The BW Tatiana LNG carrier will be converted to the region's first FSRU and will be permanently moored at the Port of Acajutla, Sonsonate, El Salvador.

Reference: Company announcements

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