

LNG Review September 2023 - Recent issues and events - Hiroshi Hashimoto*

Introduction

China's LNG import was 45.51 million tonnes during the first eight months of 2023, up 12% year-on-year, yet down 12% compared to the same period in 2021. Japan's LNG was down 13% year-on-year at 43.38 million tonnes. China's natural gas import including pipeline gas as well was 77.71 million tonnes, up 9% year-on-year and down 2% compared to the same period in 2021.

Both spot gas and LNG prices fell sharply year-on-year as of the end of September: from USD 54 to USD 13 per million Btu for TTF and from USD 40 to USD 14 for Asian spot LNG, respectively.

At two of Australia's largest LNG export projects, the labour disputes ended without major disruptions. During the protected industrial action period, 17 LNG cargoes were shipped out from the projects under the operator's BCP.

As Australia's Federal Court ruled that an environmental plan for part of Woodside's Scarborough project was invalid, the company must submit a revised environmental plan, delaying the seismic testing, previously scheduled in September. On the other hand, an engineering, procurement, and construction management (EPCm) contract was awarded for modifications to Train 1 of the Pluto LNG facility to enable the processing of Scarborough gas.

In Indonesia, the Tangguh expansion project is approaching operations, as the EPC contractors has handed the facility over to the project operator.

In the United States, Sempra was granted the Federal Energy Regulatory Commission (FERC) approval for the Port Arthur LNG Phase 2 expansion project with additional production capacity of 13 million tonnes per year of LNG.

Venture Global LNG announced its long-term expansion plan to increase production to more than 100 million tonnes per year of LNG export capacity. Commonwealth LNG has a goal of an investment decision in the first quarter of 2024, with first cargo deliveries expected in 2027, after securing several offtaking deals for the capacity of 9.3 million tonnes per year of LNG.

While QatarEnergy has changed its LNG company name from "Qatargas" to "QatarEnergy LNG", it has revealed progresses in its CCS project and its fleet expansion program associated with the mega LNG expansion projects.

* The writer belongs to the Energy Security Unit.

[Asia Pacific]

China's Beijing Gas received the commissioning cargo for the first phase of its Tianjin Nangang LNG import terminal on 27 September 2023. The first phase has a capacity of 5 million tonnes per year, with four 220,000 m³ LNG storage tanks.

Guangxi Zhuang Autonomous Region Beibu Gulf Economic Zone Planning and Construction Management Office announced on 19 September 2023 that China Oil & Gas Pipeline Network Corporation (PipeChina) had completed lifting the roofs on two storage tanks at its Beihai LNG terminal in the Guangxi province.

China's Hudong-Zhonghua shipbuilding company announced on 6 September 2023 that it had received approvals in principle (AiP) certificates for the 271,000-cbm LNG carrier design from ABS, Lloyd's Register (LR), Bureau Veritas (BV), and DNV.

CLP Power Hong Kong Limited and The Hongkong Electric Co., Ltd (HK Electric) on 21 September 2023 held an opening ceremony for the Hong Kong Offshore Liquefied Natural Gas (LNG) Terminal. Jointly developed and constructed by the two power companies since 2020, Hong Kong Offshore LNG Terminal is located to the east of the Soko Islands and went into service in July 2023. The Bauhinia Spirit is the world's largest FSRU vessel and has an LNG storage capacity of 263,000 cubic metres. The natural gas is sent by two separate subsea pipelines to CLP Power's Black Point Power Station and HK Electric's Lamma Power Station.

Australia's Minister for Resources and Northern Australia outlined on 13 September 2023 outlined the potential for Australia to build a new industry to decommission offshore oil and gas infrastructure and released an issues paper that points to the opportunities for the sector. In a statement to Parliament, the Minister said work to decommission infrastructure when projects finish production could be worth up to AUD 60 billion over the next 30 to 50 years.

The Australian Competition and Consumer Commission's (ACCC) September 2023 interim gas inquiry report shows that Australia's east coast gas market should have a 1.4 petajoule (PJ) (3,388 tonnes) surplus in the first quarter of 2024, even if the LNG producers export all their uncontracted gas. The first quarter is a period of high LNG export demand and reduced residential gas heating demand due to warmer weather.

At Chevron-operated Gorgon, Wheatstone downstream and Wheatstone platform facilities, talks between the company and the labour unions failed, leading to intermitted work stoppages from 8 September and a 24-hour strike from 14 September. Subsequently, however, the two sides agreed on the country's Fair Works Commission's (FWC) recommendations to settle the dispute by 22 September, ending the industrial actions.

Australia's Woodside and Kansai Electric Power (KEPCO) announced by 7 September 2023 that they had signed a non-binding Memorandum of Understanding (MOU), to enable studies of a potential carbon, capture and storage (CCS) value chain between Japan

and Australia. KEPCO plans to research the capture of carbon dioxide (CO₂) emitted from its thermal power plants and its transport to Australia. Woodside is progressing CCS projects in Australia and will conduct the study of injection and storage of CO₂ delivered from Japan as well as the potential production of Synthetic Methane (e-methane).

Woodside announced the same deal separately on 12 September 2023 that it had signed a non-binding Memorandum of Understanding (MOU) with three Japanese companies to enable studies of a potential carbon, capture and storage (CCS) value chain between Japan and Australia (which Toho Gas Co., Ltd. and Kawasaki Kisen Kaisha, Ltd. (K LINE) announced on 7 September 2023).

Australia's Federal Court ruled on 28 September 2023 that an environmental plan for part of Woodside's Scarborough project was not legally approved by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) and is therefore invalid.

KBR announced on 25 September 2023 that it had been awarded an engineering, procurement and construction management (EPCm) contract by Woodside Energy, as operator for and on behalf of the Pluto Joint Venture. KBR will undertake modifications to Train 1 of Woodside's Pluto LNG facility. The modifications will enable the processing of up to 3 million tonnes per year of Scarborough gas through Train 1.

Saudi Aramco announced on 28 September 2023 that it had signed agreements to acquire a minority stake in MidOcean Energy. MidOcean Energy is an LNG company formed and managed by EIG, a leading institutional investor in the global energy and infrastructure sectors. MidOcean Energy is in the process of acquiring interests in four Australian LNG projects. The strategic partnership with MidOcean Energy marks Aramco's first international investment in LNG.

Mitsui O.S.K. Lines, Ltd. (MOL) announced on 25 September 2023 that MOL had principally reached an agreement with PETRONAS CCS Ventures Sdn Bhd and MISC Berhad for the potential establishment of a joint venture to invest in the development and monetisation of Liquefied Carbon Dioxide (LCO₂) carriers for CCS projects.

Australia's Conrad Energy Asia and Singapore's SembCorp Gas announced on 12 September 2023 that Indonesia's regulator SKK Migas had given the green light to the first long-term gas sales agreement for the Mako gas field starting supply in 2025. Conrad Energy Asia is the operator of the Duyung production sharing contract (PSC) in the Natuna Sea.

Japan's Chubu Electric Power Co., Inc. announced on 11 September 2023 that the company and bp subsidiary BP Berau Ltd had signed a Memorandum of Understanding (MoU) for the feasibility study of an international CCUS value chain from Port of Nagoya, Japan, using CO₂ storage at the Tangguh field in Teluk Bintuni, Papua Barat, Indonesia. The Tangguh CCUS project is under a FEED study stage with a development plan that has

received approval from the Government of Indonesia in 2021.

Indonesia's Pertamina announced on 20 September 2023 that the company's subsidiary PT Kilang Pertamina Internasional and BP Berau Ltd (bp), the operator of Tangguh and acting on behalf of the Tangguh Production Sharing Cooperation Contract (PSC) Contractor, had signed a Memorandum of Understanding (MoU) for cooperation on a study to be carried out by Pertamina regarding the potential for gas supply and CO₂ injection in Tangguh related to the potential for developing blue ammonia.

Saipem announced on 1 September 2023 that the company and its joint venture partners, Tripatra, and Chiyoda Corporation, had handed over the LNG Tangguh Expansion Project in Tangguh West Papua, Indonesia to bp.

Indonesia's PT Amman Mineral Internasional Tbk (AMMN) announced on 20 September 2023 that its subsidiary PT Amman Mineral Nusa Tenggara (AMNT) had signed a Heads of Agreement (HoA) with Pertamina to ensure a steady supply of LNG for AMNT's upcoming 450 MW combined cycle power plant (CCPP) and its copper smelter. The CCPP is targeted to be operational in 2024.

JGC Holdings, Osaka Gas, and INPEX announced on 25 September 2023 that the three companies and Indonesia's PT Perusahaan Gas Negara Tbk (PGN, a natural gas supplier and subsidiary of Pertamina) had started detailed discussions on commercialization of biomethane derived from palm oil mill effluent (POME) in Indonesia. The companies assume that biomethane production would begin in southern Sumatra in 2025. The companies will consider supplying bio-LNG as a bunker fuel, exporting bio-LNG.

Santos announced on 1 September 2023 that it had executed a binding sale agreement to deliver Kumul Petroleum Holdings Limited (Kumul) a 2.6% participating interest in PNG LNG. Completion is conditional only on the approval of the PNG competition regulator by 31 December 2023. Santos has agreed to grant Kumul a call option to acquire a further 2.4% participating interest in PNG LNG.

[North America]

The American Gas Association (AGA) announced on 14 September 2023 that the Potential Gas Committee (PGC) had released its year-end assessment of the nation's estimated natural gas resource base, "Potential Supply of Natural Gas in the United States". Future gas supply totals 3,978 trillion cubic feet (83 billion tonnes) in 2022, an increase of 3.6% from the comparable year-end estimate in 2020.

Sempra Infrastructure, a subsidiary of Sempra, announced on 12 September 2023 that it had completed the sale of a 42% indirect, non-controlling interest in its Port Arthur LNG Phase 1 project to KKR. Sempra Infrastructure retains a controlling 28% indirect interest in Phase 1 and ConocoPhillips owns the remaining 30% interest. Sempra

Infrastructure reached a positive final investment decision (FID) for Port Arthur LNG Phase 1 in March 2023 and contracted Bechtel Energy Inc. to build the project. The expected commercial operation dates for Train 1 and Train 2 are 2027 and 2028, respectively.

Sempra Infrastructure, a subsidiary of Sempra, announced on 21 September 2023 that the Federal Energy Regulatory Commission (FERC) had approved the permit authorizing the Port Arthur LNG Phase 2 expansion project under development at Port Arthur LNG in Jefferson County, Texas. The proposed Phase 2 project includes the addition of two liquefaction trains (trains 3 and 4) capable of producing up to 13 million tonnes per year of LNG. The company recently acquired 38,000 acres of pore space and relevant surface rights to support the proposed Titan Carbon Sequestration project.

Tellurian Inc. and Baker Hughes announced on 5 September 2023 an agreement to supply eight main refrigerant compression packages for Phase 1 of the Driftwood LNG project. The agreement secures a delivery schedule for the eight LM6000PF+ gas turbines, main refrigerant compressors, and control units required for Phase 1 which targets LNG production in 2027.

NextDecade Corporation announced on 20 September 2023 that its subsidiary, Rio Grande LNG, LLC (RGLNG), had entered into a credit agreement with a group of lenders for USD 356 million of senior loans to finance a portion of the first three LNG trains (Phase 1) at NextDecade's 27 million tonnes per annum (MTPA) Rio Grande LNG export facility in Brownsville, Texas.

Venture Global LNG announced on 04 September 2023 its long-term expansion plan to increase production from 70 million tonnes per year to more than 100 million tonnes per year of nameplate LNG export capacity. To support this initiative, Venture Global and Baker Hughes have executed an expanded master equipment supply agreement for the delivery of additional liquefaction train systems and power island systems for Venture Global's future LNG export projects.

EQT Corporation announced on 18 September 2023 that it had entered into a Heads of Agreement (HOA) for liquefaction services from Commonwealth LNG's facility in Cameron, Louisiana to produce 1 million tonnes per year of LNG under a 15-year tolling agreement. Commonwealth anticipates a final investment decision (FID) on the project in the first quarter of 2024, with first cargo deliveries expected in 2027.

Carbonvert Inc. and Castex Energy, Inc., through its wholly owned subsidiary, Castex Carbon Solutions, LLC announced on 18 September 2023 the execution of an operating agreement with the State of Louisiana to develop a 24,000 acre tract of land situated in State waters, offshore Cameron Parish, to permanently store carbon dioxide (CO₂). The Cameron Parish CO₂ Hub has a total storage capacity of more than two hundred and fifty million metric tons of CO₂.

Enbridge Inc. announced on 5 September 2023 that it had entered into three agreements with Dominion Energy, Inc. to acquire EOG, Questar and PSNC. Enbridge will add gas utility operations in Ohio, North Carolina, Utah, Idaho and Wyoming. Enbridge's gas utility business will be the largest, by volume, in North America delivering over 9 bcf/d (68.36 million tonnes per year) of gas to approximately 7 million customers.

JERA Co., Inc. announced on 5 September 2023 that, through its subsidiary JERA Americas Inc., had signed a Heads of Agreement (HOA) with Uniper Global Commodities S.E. in Germany and ConocoPhillips in the United States for the sale to Uniper of low carbon hydrogen/ammonia produced in the United States. JERA, in cooperation with ConocoPhillips, had signed an MOU (announced on 5 September 2022) with Uniper for the procurement and sale of low carbon hydrogen/ammonia produced in United States. JERA in collaboration with ConocoPhillips is developing a manufacturing base in the United States Gulf Coast that will produce hydrogen on a large scale and convert it into ammonia. The companies aim to start commercial production at the end of the 2020s at a plant with an initial production capacity of approximately 2 million tonnes per year.

Seapath, a maritime subsidiary of Libra Group, and Pilot LNG, LLC (Pilot), a Houston-based clean energy solutions company, announced on 28 September 2023 that they had formed a joint venture (JV) to develop, construct, and operate the first LNG bunkering facility in the U.S. Gulf Coast. With operations beginning in early 2026, the construction of the new facility will provide fuel for LNG-powered vessels in the greater Houston/ Galveston area of Texas. Pilot and Seapath will continue with all front-end engineering and design (FEED) development for their projects in the third and fourth quarters of 2023 to file applications with the necessary federal and state agencies to permit, site, construct and operate the small-scale LNG terminal for marine fuel. Pilot and Seapath anticipate announcing details of their project investment by the second half of 2024.

Australia's Santos announced on 19 September 2023 that it would farm-down half of its working interest in 148 exploration leases (more than 270 thousand acres of State of Alaska lands) on the Alaska North Slope in an agreement with APA Alaska LLC and Lagniappe Alaska LLC. Santos acquired the acreage as part of its merger with Oil Search in 2021. Santos said that it had been able to optimise its working interest in its Alaskan acreage in line with the strategy to focus on development of the Pikka project.

bp announced on 5 September 2023 that bp had entered its third long-term LNG offtake contract from the Woodfibre LNG facility based in British Columbia, Canada. With the additional contract to offtake 0.45 million tonnes of LNG per year for 15 years on a free on board (FOB) basis, all of the LNG production from the Woodfibre LNG export facility is now committed for sale to bp, with firm offtake totalling 1.95 million tonnes per year and the remainder on a flexible offtake basis. bp says that it works towards building an LNG portfolio

of 30 million tonnes by 2030.

New Fortress Energy (NFE) announced on 27 September 2023 that the Pioneer II rig had set sail towards Altamira, Mexico, where it would act as the liquefaction unit for the 1.4 million tonnes per year Fast LNG Altamira production project due to start up in coming weeks. The Fast LNG Altamira project will use three rigs: Pioneer II for liquefaction, Pioneer I for gas treatment and Pioneer III for accommodation and utilities. The other two rigs are already in place.

[Middle East]

Abu Dhabi's ADNOC Gas announced on 7 September 2023 an agreement, valued between USD 450 million (AED 1.65 billion) and USD 550 million (AED 2 billion), to supply LNG to PetroChina International Company Limited (PCI).

ADNOC announced on 6 September 2023 a final investment decision (FID) on the Habshan carbon capture, utilization and storage (CCUS) project which the company claimed one of the largest carbon capture projects in the Middle East and North Africa (MENA) region, with the capacity to capture and permanently store 1.5 million tonnes per year of carbon dioxide (CO₂).

QatarEnergy announced on 14 September 2023 that Qatargas had changed its name to "QatarEnergy LNG".

Worley announced on 25 September 2023 that it would provide front-end engineering design (FEED) services for QatarEnergy LNG's CO₂ sequestration project in Ras Laffan, Qatar. Worley's team will develop the FEED study and engineering, procurement and construction (EPC) scope of work, set for completion in 2024. The sequestration facility will be capable of capturing 4.3 million tonnes of CO₂ every year.

QatarEnergy announced on 27 September 2023 that it had signed an agreement with Korea's HD Hyundai Heavy Industries (HHI) for the construction of 17 ultra-modern LNG carriers. The deal marks the start of the second phase of QatarEnergy's LNG ship acquisition program, which will support its expanding LNG production capacity from the North Field LNG expansion and Golden Pass LNG export projects as well as its long-term fleet replacement requirements. Together with the 60 ships that were contracted for by QatarEnergy in the first phase of the program, which will be built at Korean and Chinese shipyards, the latest agreement brings the total number of confirmed new LNG vessels to be delivered to QatarEnergy and its affiliates to 77.

[Europe / Surrounding regions]

PRISMA announced on 11 September 2023 that the AggregateEU third tendering round would kick off on 21 September (the schedule was first announced on 23 August). On

the day, the Demand Collection Phase will begin for companies that have subscribed to AggregateEU as buyers. This window will remain open until 27 September. From this round, sellers must express their price as a discount or a premium in EUR/MWh to the price of the Dutch TTF Natural Gas Futures for the month of delivery.

bp announced on 12 September 2023 that Bernard Looney had notified the Company that he had resigned as Chief Executive Officer with immediate effect. Murray Auchincloss, the Company's CFO, will act as CEO on an interim basis.

National Grid Ventures' Grain LNG announced on 14 September 2023 that it had launched an auction for 375 GWh/d (9 million tonnes per year) of existing capacity, running until 23 November. Grain LNG has used the positive feedback received from the recent market consultation exercise and, following Ofgem approval, is offering three lots of capacity. Each lot will consist of 42 berthing slots, 200,000 m³ of storage and 125 GWh/d (approximately 3 million tonnes per year) of regasification capacity from as early as January 2029. The business has also worked with Ofgem to arrange a 'Joint Bid' provision, facilitating arrangements whereby participants can put a joint bid in the Auction and share capacity.

Ireland's national planning agency An Bord Pleanála announced on 15 September 2023 that it had refused permission to New Fortress Energy's (NFE) Shannon LNG terminal and adjacent 600 MW power plant in Count Kerry. The Board said that it would not be appropriate to permit or proceed with any LNG development in Ireland before completion of the government's energy security review.

ConocoPhillips announced on 14 September 2023 that it had signed a commercial agreement to secure additional regasification capacity at the Gate LNG terminal in the Netherlands for 1.5 million tonnes per year, or 2 BCM, for 15 years from September 2031.

The Netherlands' Gate terminal B.V, a joint venture of Vopak and Gasunie, announced on 15 September 2023 that it had selected -VINCI Construction Grands Projets - Entrepose Contracting (tank), Sener (balance of plant) and Sacyr Proyecta (owner engineering services) to execute the expansion of the terminal with a 4th LNG storage tank of 180,000 cubic meters and an additional regasification capacity of 4 bcm per year.

The Netherlands' NAM announced on 22 September 2023 that the cabinet had taken the decision that gas extraction from the Groningen gas field would stop as of 1 October. The cabinet will keep open the possibility of restarting gas extraction in exceptional circumstances in winter 2023/2024.

Société Générale revealed on 18 September 2023 its new upstream oil and gas exposure reduction targets: -80%upstream exposure by 2030 vs. 2019, with an intermediary step in 2025 at -50% vs. 2019 (vs. previous commitment of -20%).

TotalEnergies announced on 14 September 2023 that the company was launching a call for tenders for the supply of 500,000 tonnes per year of green hydrogen for the

company's European refineries. TotalEnergies has six refineries in Europe - Antwerp (Belgium), Leuna (Germany), Zeeland (Netherlands), Normandy, Donges and Feyzin (France) - as well as two biorefineries in La Mède and Grandpuits (France).

Germany's public-sector company Deutsche Energy Terminal GmbH (DET) announced on 19 September 2023 that it was holding auctions for regasification capacities including storage and send-out for the first time. In two digital auction rounds, which are to start on 16 and 23 October, respectively, market players will be able to acquire utilization rights for the first short-term capacities in 2024 at the Brunsbüttel and Wilhelmshaven 1 terminals. Further short-term capacities at the Stade and Wilhelmshaven 2 terminals are planned to be offered in a subsequent auction round in December 2023. The marketing of long-term capacities with a term of more than one year is planned for April 2024.

Spain's grid operator Enagás announced on 29 September 2023 that it had bought the entire 130 km network of gas pipelines from Spanish gas transportation company Reganosa. In turn, Reganosa has bought 25% of the El Musel LNG terminal from Enagás. Enagás has added that the purchase of the pipeline network feeds into its drive to move to hydrogen.

Moss Maritime, owned by the Italian company Saipem, announced on 5 September 2023 that it had been granted an Approval in Principle (AIP) from the classification society DNV for a containment system for ship transport of liquefied hydrogen (LH₂). Moss Maritime says that the LH₂ containment system design is inspired by the Moss LNG spherical containment system. Moss Maritime has developed the design in cooperation with the Norwegian research institute SINTEF, as well as having received technical support from DNV and funding from the Research Council of Norway. Moss Maritime has also been supported by Shell, Equinor and TotalEnergies in the design development.

The U.S. Department of State announced on 14 September 2023 that it had designated individuals and entities to impose further costs in response to Russia's unprovoked war against Ukraine. The Department of State said that it was designating 37 entities involved in expanding Russia's energy production and future export capacity and identifying two related vessels as blocked property. These designations include entities and individuals involved in the development of key energy projects and associated infrastructure, including Russia's Arctic LNG 2 project. The Department of State added Novatek's subsidiary Arctic Transshipment, the operator of the Murmansk and Kamchatka LNG transshipment terminals to the list.

Russia's NOVATEK announced on 12 September 2023 that NOVATEK and Rosseti had signed a Strategic Partnership Agreement to supply power to the Murmansk LNG project. The project's feature is the use of electric drives for process compressors instead of gas turbines.

Russia's Gazprom announced on 15 September 2023 that the LNG tanker Veliky Novgorod with a cargo of LNG produced at the complex near the Portovaya compressor station completed unloading at the Tangshan LNG receiving terminal in China. This is the first delivery of Gazprom's LNG via the Northern Sea Route.

[South America]

The AES Corporation announced on 26 September 2023 that it had agreed to minority sell-downs of its businesses in the Dominican Republic and Panama, as an expansion of its existing strategic partnership with Grupo Linda and a new partnership with Grupo Popular's subsidiary, AFI Popular. The agreements include the sale of 10% of AES' business in the Dominican Republic to Grupo Linda and Grupo Popular's subsidiary, AFI Popular. AES' businesses in the Dominican Republic include an LNG regasification terminal, with a 160,000 m³ LNG capacity storage tank, the AES Andres 319 MW combined cycle gas turbine plant, DPP 328 MW combined cycle gas turbine, as well as an additional 150 MW of solar and wind power plants. The announcement includes the sale of 20% of AES Colón in Panama, also to Grupo Linda. AES Colón includes a 381 MW combined cycle gas turbine with an adjacent regasification facility that has a 180,000 m³ LNG capacity storage tank.

The National Gas Company of Trinidad and Tobago Limited (NGC) announced on 22 September 2023 that it and Shell Trinidad and Tobago Limited had signed an amended Domestic Gas Sales Contract (DGSC) to incorporate a share of the natural gas volumes from the Shell-operated Manatee field once the project is sanctioned. In 2019, the Governments of Trinidad and Tobago and Venezuela executed an agreement to allow each country to independently develop its share of hydrocarbon resources from the Loran-Manatee Gas field, which straddles the maritime border between the two countries.

[Global issues]

Daphne Technology announced on 11 September 2023 that a trial was getting underway to get methane abatement technologies aboard an in-service LNG carrier. The test will employ technology from Daphne Technology while combining the expertise of Wärtsilä as the engine manufacturer.

Contact: report@tky.ieej.or.jp