

LNG Review November 2019
- Recent issues and events -
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Introduction

In late November 2019, the federal energy regulators of the United States approved construction of four additional LNG projects in Texas with combined annual production capacity of 48 million tonnes. The regulators had already approved another seven projects with 89 million tonnes of combined capacity earlier in the year. The United States is expected to have more than 100 million tonnes per year of LNG production capacity from those projects in operation and those projects that have already made final investment decisions. In addition, 160 million tonnes per year of production capacity could come from those projects that have already secured federal construction approvals but have not made investment decisions.

In Qatar, the current largest exporter of LNG, state Qatar Petroleum (QP) has revealed plans to expand its LNG production capacity by 64% from the current 77 million tonnes per year to 126 million tonnes per year in 2027.

Assessed spot LNG prices in Northeast Asia continue being traded at the lowest levels in the history. Those for immediate next month delivery have stayed under USD 6 per million Btu since late October 2019. Those for January delivery have been below USD 6 for the first time.

China's natural gas consumption, which has been the main driver of growth of LNG demand in Asia in recent years, increased yet steadily by 9.5% year-on-year during the first nine months of 2019. However, the growth rate was a little moderated compared to 15% in the whole year 2017 and 18% in the whole year 2018. Potential impacts of the imminent Russian pipeline gas supply to the Chinese market on the LNG market should be closely monitored.

[Asia Pacific]

According to Japan's customs statistics, Japan imported 6.30 million tonnes of LNG at the average price of USD 9.42 per million Btu in October 2019. Among the total, volumes from the United States represented 0.59 million tonnes, the largest monthly tally in the

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history, with the average price of USD 8.83, while Russia provided 0.53 million tonnes at USD 8.26. During the first ten months of 2019, Japan imported 64.25 million tonnes of LNG, or 7.2% less than one year earlier.

Toho Gas and Mitsui O.S.K. Lines (MOL) announced the implementation of a demonstration test to supply LNG (LNG bunkering) to the LNG-fueled tugboat Ishin in the Port of Nagoya. LNG was transported via truck from the Toho Gas Chita-Midorihama LNG Terminal, and supplied with a truck-to-ship system to Ishin at the Port of Nagoya's Garden Pier.

Mitsui O.S.K. Lines (MOL) plans to construct the first two LNG-fueled ferries in Japan.

Kawasaki Kisen Kaisha (K Line) revealed that the company in December 2018 placed an order for a car carrier vessel fuelled by LNG with Imabari Shipbuilding. Expected completion will be in the fall of 2020.

Kawasaki Kisen Kaisha (K LINE) and FueLNG concluded a ship management agreement for the 7,500 m³ LNG-Bunkering Vessel (LBV) that FueLNG will own, operate and carry out all commercial operations. The LBV is expected to commence LNG-bunkering service in Singapore in the second half of 2020 after delivery from Keppel Offshore & Marine's shipyard. This will be the first LNG Bunker Vessel providing ship-to-ship bunkering in Singapore. FueLNG is a joint venture between Keppel Offshore & Marine and Shell Eastern Petroleum.

According to figures from NDRC (National Development and Reform Commission), China's natural gas production, import, and consumption during the first ten months of 2019 were respectively 142.28 bcm, 106.79 bcm, and 246.28 bcm, increasing year-on-year by 10.2%, 8.4%, and 9.5%. According to China's trade statistics, the country imported 6.524 million tonnes of natural gas in October 2019, 10.3% less than it did one year earlier. The country imported 77.71 million tonnes of natural gas during the first ten months of 2019, a 7.9% increase year-on-year.

India's Petronet LNG has installed LNG dispensing stations both at Dahej and Kochi terminals and procured buses to run on LNG as fuel at both locations. The station and buses at Kochi are under final stages of commissioning.

Australian Gas Infrastructure Group (AGIG) was awarded a project by Woodside for the pipeline component of its Pluto-North West Shelf (NWS) Interconnector. A new 30-inch diameter pipeline will run 3.2 kilometres, connecting the Woodside-operated Pluto LNG Plant to the NWS Project's Karratha Gas Plant (KGP), and is the first component of the infrastructure needed to transport gas between the two facilities.

Woodside said that the estimated gross contingent resource dry gas volume for the

Scarborough field has increased to 11.1 Tcf (100%; 8.3 Tcf Woodside share), up 52% from 7.3 Tcf (100%; 5.5 Tcf Woodside share).

Woodside and BHP agreed the tolling price for processing gas from the Scarborough offshore field at the Pluto LNG facility on Western Australia's Burrup Peninsula. The tolling price is valid to 31 March 2020. The toll is based on BHP maintaining no more than a 25% interest in Scarborough (WA-1-R) up to final investment decision (FID). Scarborough gas would initially be processed on a deep-water floating production unit and transported through an approximately 430 km pipeline to be processed at the Pluto LNG facility. First LNG from the proposed development is targeted in 2024.

INPEX announced that the 100th shipment of LNG departed from the Ichthys LNG Project's (the Project) onshore gas liquefaction plant in Darwin in the Northern Territory of Australia. Shipments of LNG from the Project commenced in October 2018.

Strike Energy said its recent West Erregulla gas discovery in the Perth basin as one of the largest ever conventional gas fields ever discovered onshore Australia.

Wesfarmer's subsidiary EVOL LNG's Kwinana LNG production facility will undergo a major expansion to supply growing demand from the mining sector to replace the use of diesel for power generation with natural gas. The Kwinana LNG plant, constructed in 2008 with a nameplate capacity of 175 tonnes per day, will increase its capacity to 250 tonnes per day from April 2020, with plans for a further potential expansion to approximately 300 tonnes per day in 2021. EVOL LNG has agreements with seven mining customers in Western Australia and operates a fleet of over 30 road tankers.

According to Santos, completion of the ConocoPhillips' assets acquisition is expected in the first quarter of 2020, subject to third-party consents and regulatory approvals. At completion of the acquisition and expected 25% sell-down to SK E&S, Santos' interest in Bayu-Undan and Darwin LNG will be 43.4% (11.5% pre-transactions).

Indonesia's PGN (Perusahaan Gas Negara) unit of Pertamina signed a deal to supply LNG to China's Sinopec in 2020 from Pertamina's portfolio.

[North America]

Dominion Energy's Cove Point LNG plant loaded its 100th commercial LNG ship on Monday 11 November 2019, nineteen months after the facility entered commercial service. Cove Point produces LNG under 20-year contracts for ST Cove Point, a joint venture of Sumitomo Corporation and Tokyo Gas, and for Gail Global (USA) LNG.

In early December 2019, McDermott and Chiyoda announced that Train 2 of the Cameron project, has reached the final commissioning stage. This includes the introduction of pipeline feed gas into Train 2.

Freeport LNG has filed a letter with FERC (Federal Energy Regulatory Commission) requesting authorization to place Train 1 and the Common Facilities at its liquefaction and export site on Quintana Island, Texas, in-service.

Tellurian reports said in its third quarter 2019 results that the company progressed the engineering for the Driftwood liquefaction plant, completing 26% of the total required.

In early December 2019, Energy Transfer LP (ET) announced that a comprehensive commercial tender package has been issued to engineering, procurement and construction (EPC) contractors to submit final commercial bids for the proposed Lake Charles LNG liquefaction project being developed by ET and Shell. The project would modify ET's existing LNG import facility in Lake Charles, Louisiana to add LNG liquefaction capacity of 16.45 million tonnes per year. The commercial bids are expected to be received in the second quarter of 2020. The commercial tender invites the EPC contractors to develop a comprehensive commercial bid for the lump sum turnkey contract.

FERC approved four LNG projects, including three projects along the Brownsville Ship Channel in Brownsville, Texas - Texas LNG Brownsville; Rio Grande LNG; and Annova LNG - and a project by Corpus Christi Stage III to build the Stage 3 LNG Project in San Patricio and Nueces counties, Texas. FERC earlier in 2019 approved LNG projects proposed by Venture Global Calcasieu Pass; Driftwood LNG; Port Arthur LNG; Gulf LNG; Eagle LNG Partners Jacksonville; Venture Global Plaquemines LNG; and Freeport LNG's Train 4 Expansion Project. Four projects are now pending before the Commission.

Gunvor and Commonwealth LNG entered into a Strategic LNG Marketing & Gas Supply Agreement in relation to Commonwealth's LNG export project in Cameron Parish, Louisiana. Gunvor will support Commonwealth in securing binding LNG offtake and gas supply agreements for the full capacity of the facility. In addition, Gunvor will commit to take up to 3 million tonnes per year. Commonwealth LNG expects to take a final investment decision (FID) in Q1 of 2021 and deliver its first shipments of LNG in Q2 of 2024.

FERC released the Final Environmental Impact Statement (EIS) for Jordan Cove Energy Project's proposed liquefaction and LNG export terminal in Coos Bay, Oregon. The Final EIS "concludes that constructing and operating the project would result in temporary, long-term, and permanent impacts on the environment. Many of these impacts would not be significant or would be reduced to less than significant levels with the implementation of proposed and/or recommended impact avoidance, minimization, and mitigation measures. However, some of these impacts would be adverse and significant. Specifically, the final EIS concludes that constructing the project would temporarily, but significantly impact housing in Coos Bay; that constructing and operating the project would permanently and significantly impact the visual character of Coos Bay; that noise resulting from pile driving activities at the

LNG terminal would temporarily, but significantly impact the Coos Bay area; and that the project could have a significant impact on the Southwest Oregon Regional Airport operations. Furthermore, constructing and operating the project is likely to adversely affect 18 federally-listed or proposed threatened and endangered species."

[Middle East]

Qatar Petroleum (QP) announced that it will raise Qatar's LNG production capacity to 126 million tonnes per year by 2027, an increase of 64% from the current 77 million tonnes per year. The Minister of State for Energy Affairs also announced that new studies have revealed that the North Field's productive layers extend well into Qatari land in Ras Laffan. The latest North Field appraisal well (NF-12) was drilled onshore in the Ras Laffan Industrial City.

QP announced the completed fabrication of the first two jackets required for offshore facilities as part of its North Field Expansion (NFE) Project. The NFE project's Engineering, Procurement, Construction and Installation contract for the jackets was awarded to McDermott in April 2019. McDermott was also awarded the Front End Engineering and Design contract for the associated topsides and pipelines in May 2019.

ADNOC LNG concluded supply agreements with BP and TOTAL, effectively booking out the majority of its LNG production through Q1 2022. ADNOC LNG produces 6 million tonnes per year of LNG. ADNOC LNG is 70% owned by ADNOC. Additional shareholders are Mitsui & Co (15%), BP (10%), and TOTAL (5%).

In its third quarter 2019 report, Teekay LNG said it anticipate the start-up of the Bahrain regasification terminal before the end of 2019.

Energean Oil and Gas announced that Energean Israel and MRC Alon Tavor signed a Gas Sales and Purchase Agreement for 0.5 bcm per year, or up to 8 bcm over the term of the contract. Supply will commence at Karish first gas and the contract term is for a period of 15 years from the date of signature. The GSPA is linked to the Israeli Electricity Production Index and has floor pricing and take-or-pay provisions. Energean now has firm GSPAs for 5 bcm per year of gas into the Israeli domestic market.

[Africa]

Algeria's SONATRACH and France's ENGIE entered into medium-term agreements for sale and purchase of LNG and pipeline gas supply. SONATRACH will deliver volumes of natural gas via the Transmediterranean pipeline, as well as LNG, mostly at the Fos Tonkin LNG terminal in France.

Woodside, as operator of the Sangomar Field Development¹, revealed that the

Sangomar Development and Exploitation Plan and exploitation authorisation request were submitted to the Government of Senegal on 2 December 2019. The Sangomar Field Development Phase 1 concept is a stand-alone floating production storage and offloading (FPSO) facility with 23 subsea wells and supporting subsea infrastructure. The FPSO is expected to have a capacity of around 100,000 bbl/day, with first oil targeted in early 2023. The FPSO will be designed to allow for the integration of subsequent Sangomar development phases, including gas export to shore and future subsea tie-backs from other reservoirs and fields.

The Board of Directors of the African Development Bank Group (AfDB.org) approved a long-term Senior Loan of USD 400 million to support the Mozambique LNG Area 1 Project. AfDB joins a global syndicate of commercial banks, development finance institutions, and export credit agencies, to jointly provide the requisite senior debt financing for the project. Financial close is expected within the first half of 2020.

[Europe / Russia]

The board of the European Investment Bank (EIB) agreed a new energy lending policy. The new energy lending policy details principles that will govern future EIB engagement in the energy sector. The EIB will no longer consider new financing for unabated, fossil fuel energy projects, including gas, from the end of 2021 onwards.

United Kingdom government announced a moratorium on fracking in England until compelling new evidence is provided. Cuadrilla Resources responded that it will review the reports in detail and continue to work with the OGA to provide further detailed data to address concerns so that the moratorium can be lifted.

Grain LNG exported the highest ever amount of gas in a single day from any European terminal into the United Kingdom network. The terminal exported 698 GWh (46,163 tonnes) of gas, beating its previous record by more than 100 GWh. Grain LNG recently launched an 'open season' process for customers interested in buying capacity from 2025. Grain LNG is expecting to allocate capacity by the end of March 2020.

Mitsubishi Corporation (MC) and Chubu Electric Power have been selected as the preferred buyers in a bid for the Dutch Energy Company "Eneco". MC and Chubu expect to acquire up to 100% of Eneco's shares.

Elengy conducted an Open Subscription Period (OSP) for Montoir-de-Bretagne LNG terminal, from July to November 2019 to offer the not yet subscribed regasification capacity, i.e. more than 3.5 billion cubic meters (bcm) per year, for the period 2021 to 2035. As a result, the terminal is now fully booked between 2023 and 2035. And only few capacities remain available in 2021 and 2022. Elengy and its subsidiary Fosmax LNG, owner of the Fos Cavaou

LNG terminal near Marseille, are now willing to study the different development options for offering capacities at Fos Cavaou LNG terminal beyond 2030 and at Montoir-de-Bretagne beyond 2035.

Elengy and Rubis Terminal signed a memorandum of understanding (MOU) to launch preliminary studies for the development of an LNG storage facility at the Reichstett (Bas-Rhin) storage terminal. The project is targeting the retail LNG needs of west-central Europe for the industrial and transport sectors. The planned site will be able to handle an annual volume of 85,000 tonnes of LNG. The satellite storage will be supplied by rail from one of Elengy's terminals (Fos Tonkin or Montoir-de-Bretagne). Customers will then have their LNG delivered by trucks. Commissioning is scheduled for 2022.

MAN Energy Solutions and Wessels Marine GmbH announced a technical showcase whereby the 2017-retrofitted 'Wes Amelie', a 1,036-teu feeder container ship, will use liquefied SNG (Synthetic Natural Gas) produced from renewable electrical energy as drop-in fuel. 20 of the 120 tonnes of LNG that the Wes Amelie typically uses per round trip will be replaced by climate-neutral SNG. As a result, CO₂ emissions are expected to decline by 56 tonnes for this trip. Automobile manufacturer Audi's Power-to-Gas facility in Werlte, where a liquefaction plant is currently under construction, will provide the SNG, which will be generated by wind energy and is thus 100% climate-neutral. The SNG trip will take place after the completion of the liquefaction plant in Q2 2020.

Chart Industries completed commissioning of Europe's largest LNG fueling station for Alternoil. The station is located on Germany's main A1 highway near the city of Bakum, expecting final approval by local authorities in December 2019.

From January 2020, Volkswagen Group Logistics will deploy two LNG car freight ships with 4,700 cars transport capacity each between Europe and North America. The ships from Siem Car Carriers AS were launched in Xiamen, China.

Gasum is acquiring AGA's Clean Energy business and Nauticor's Marine Bunkering business from Linde AG. Assets transferred include an LNG liquefaction plant, two LNG terminals, two LNG bunkering vessels, and 48 gas filling stations in Sweden and Norway.

Polish Oil and Gas Company (PGNiG) signed a contract with Klaipėdos Nafta (KN) to be the sole user of the small-scale LNG reloading station in Klaipėda for five years from April 2020.

According to preliminary figures at Gazprom Facebook page, the company produced 0.5% more natural gas amounting to 431.9 bcm between January to 15 November 2019 than it did during the same period one year earlier. Its natural gas export to non-CIS nations decreased by 1.1% to 169.7 bcm during the same period.

Start-up and commissioning process is in its final stage at the TurkStream gas

pipeline, to be brought into operation by the end of 2019. Both strings of TurkStream - from the onshore facilities in the Russian side to the receiving terminal on the Turkish coast - are filled up with gas.

Yamal LNG shipped the first cargo of LNG to Bangladesh in accordance with the long-term offtake agreement with TOTAL. The consignment was delivered along the westbound route via the Suez Canal with transshipment from an ice class Arc7 LNG tanker to a conventional LNG tanker at the Zeebrugge terminal in Belgium. The cargo was unloaded at the Summit LNG Terminal in Bangladesh.

In early December 2019, Russia's Gazprom and China's CNPC announced that the Power of Siberia pipeline commenced operation. In early November, Gazprom Export supplied Russia's first small-scale LNG cargo to Mongolia. On 22 October 2019, the first ever rail LNG shipment was loaded in special containers in Yakutsk. The 36 tonne cargo arrived at Ulaanbaatar on 4 November. The shipper was Siberian fuel and energy company (SITEK) and the buyer was the Mongolian company UB Metan. The LNG will be used as motor fuel on public transport.

Gazprom Export for the first time supplied LPG by rail from Russia to China. This was done as part of the preparations for exports from the Amur gas processing plant.

[South America]

The first commercial LNG cargo has left Argentina for export, produced on board EXMAR's Tango FLNG and being transported by Excalibur, an EXMAR's fleet LNG carrier.

Reference: Company announcements, Cedigaz News Report.

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