LNG World market analysis for the week ended on Feb 25, 2023.

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Freeport LNG, finally received partial clearance to restart the liquefaction and export project which was closed since June 8 explosion and fire incident, last year. The second largest LNG export project of the United States had to undergo an extensive investigation and had to take corrective measures before restart was permitted by the US federal agencies. Thrice Freeport LNG announced restart schedule but backed out at the last moment and accepted that it had more to answer to the US federal agencies like Federal Energy Regulatory Commission (FERC) to Pipeline and Hazardous Materials Safety Administration (PHMSA). This was also a lesson for other LNG exporters from the US.

Timing of the restart of the Freeport LNG terminal may not be favourable one as warmer than the normal weather conditions in the US, discounted the possible restart impact on natural gas prices. At the same time, the biggest among the US LNG buyers, Europe too had milder weather conditions and above average gas storage levels. For Freeport LNG and other LNG exporters from the US and elsewhere, Europe is no longer an attractive proposition at least for the time being. Because of eight months long shutdown, Freeport LNG has already missed a massive opportunity to make windfall profits by selling LNG to Europe. Spot prices

surged from the June 2022 level of around $27 to its highest level of around $74 in late August 2022 before it dropped to its present level of around $14.

There are views that the spot LNG prices will change and move upward from its present level of below $15 from April onward once Europe starts filling its gas storage. As of now, spot LNG demand has remained limited mostly to Asian buyers since late January. Europe has continued to receive term cargoes tied with its LNG FSRUs. China too is looking for LNG but mostly term LNG deals as Chinese LNG demand is seen as flexible one since the Chinese authorities scrapped its zero Covid policy late last year.

Meanwhile, last week, Cheniere Energy announced a proposed expansion of its Sabine Pass terminal by 20mil mt/year. While most energy sector pundits still believe that the LNG export units will suffer a possible supply glut in mid to late 2020s due to oversupply situation and a shift in policies, leading towards extensive use of green hydrogen. With expansion, Sabine Pass liquefaction capacity will increase form present 30mil mt/year to 50mil mt/year. When operational, Sabine Pass terminal will be facing a huge competition not just from the alternative fuels like green hydrogen but also from QatarEnergy's massive North Field capacity expansion which will be commissioned in 2027- possibly much ahead of Cheniere's, at 126mil mt/year, from its present level of 77mil mt/year.

Despite all the warnings from the industry analysts about possible supply glut situation, LNG suppliers continues to explore options, to supply LNG to meet projected strong demand from Europe in 2023 through 2025. Leviathan field promoters from Israel and Chevron Corporation decided to set up a 4.6mil mt/year capacity FLNG to cater European LNG demand. Natural gas for the proposed FLNG will be supplied from the expansion of Leviathan fields capacity by 9bcm/year. Post expansion, Leviathan fields will be producing 21bcm/year gas from the fields, offshore Israel, from the current level of 12bcm/year.

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1. **Freeport LNG gets partial clearance for restart**

Freeport LNG hoping to reach full capacity 2.1mcfd by May this year with clearance for second Dock and the third LNG storage tank from the regulatory authorities.

In a statement late on Tuesday, Freeport LNG said that it has been granted an authorisation for the immediate full return to service of one liquefaction train, that has already restarted, and the incremental restart and full return to service of a second train.

Freeport didn't specify the train number in its announcement however it was train number 3 which was cleared first for restart by the federal regulators Federal Energy Regulatory Commission (FERC) and Pipeline and Hazardous Materials Safety Administration (PHMSA). "First LNG production and ship loading from the facility began on February 11," said Freeport. Apparently, Train 2 was cleared for the restart subsequently. According to Freeport LNG, "restart and return to service of Freeport LNG's third liquefaction train will require subsequent regulatory approval once certain operational conditions are met. A conservative ramp-up profile to establish three-train production of approximately 2.0 billion cubic feet per day is anticipated to occur over the next several weeks as stable operation of each incremental train is established and maintained."

Freeport said, "operations are initially utilizing two of Freeport LNG's three LNG storage tanks and one of its two LNG berths. The second LNG berth and third LNG storage tank are expected to return to service in May."

The second biggest LNG export terminal of the United States, Freeport LNG had to shutdown its terminal following an explosion and fire which occurred on June 8 last year.

In August last year, Freeport first announced its plans to resume LNG export from November 2022 and full capacity by March 2023. Subsequently, Freeport rescheduled restart deadlines for two more times but failed to meet due to regulatory requirements.

Following its public hearing on Jan 11, PHMSA official had said that the full return of the terminal capacity would "take a number of months."

Freeport LNG had loaded its fourth tanker last Saturday. Since the last tanker "Nohshu Maru," owned by JERA a Freeport stake holder and its term customer, left terminal on Saturday afternoon, no new tanker has reached to the terminal for LNG loading. No new tanker has arrived at the Freeport LNG for loading since last four days. As mentioned earlier, all four tankers were loaded with LNG which was already stored in storage tanks 1 and 2 and produced before the June 8, 2022 accident. Freeport had sought FERC permissions to load tankers to create space for fresh inventory in two storage tanks.

2. Leviathan fields expansion proposed to cater Europe's LNG demand through FLNG

Israel's Leviathan partners have decided to liquefy additional gas to be produced from the fields.

Three partners of the Leviathan field- located in the Eastern Mediterranean, Ratio Energies, NewMed Energy and Chevron each with 15%, 45.34% and 39.66% respectively, have decided to set up Floating Liquefied Natural Gas (FLNG) to covert additional gas into LNG for export to the European market.

For Leviathan field expansion and FLNG project, Leviathan partners have approved the budgets of $96.4mil. The scope of the expansion work include the Front End Engineering and Design (FEED) to increase the gas production by 9 billion cubic meters per year which will increase the total gas production capacity of Leviathan fields from existing 12bcm/year to 21bcm/year. The gas produced from the Leviathan fields since 2019 is supplied to Israel, Egypt and Jordan.

The proposed FLNG will have the capacity to convert Leviathan gas into 4.6mil mt/year LNG. Israel and Egypt have also signed a memorandum of understanding (MOU) with the European Union to supply LNG through the liquefaction plants in Egypt. With the proposed FLNG to be set up near the Leviathan fields, Israel will be able to supply LNG directly to EU as and when its commissioned.

Russia-Ukraine war left European Union member countries without Russian piped gas supply as Russia drastically reduced gas supply to European member countries following international sanctions. Throughout 2022, EU imported LNG- mostly from the US, to manage its gas requirement, replacing Russian piped gas. Most suppliers made huge profit from an extraordinary prices LNG fetched from the EU buyers, desperate to bridge the natural gas supply gap.

GAIL India will close a buy tender for three cargoes tomorrow on Feb 21. GAIL has been seeking LNG to be delivered from March through May on ex-ship basis to the Dabhol LNG receiving terminal.

Most of the South Asian buyers like GAIL finds prevailing spot prices of around $15 very attractive to tap it as much as possible. GAIL in particular, has lost 2.5mil mt/year of term LNG supply from Gazprom last year and so its desperate to buy spot LNG as much as it could to bridge the gap.

GAIL mostly receives spot LNG cargoes at the Dabhol terminal. From the current year 2023, GAIL operated Dabhol terminal will be operating during the monsoon months, starting from May to October. The terminal was unable to operate during monsoon because of lack of breakwater facility until last year.

From the current year, GAIL had announced the Dabhol terminal will become operational throughout the year as even during rough sea conditions of monsoon months between May to end of September, breakwater facility would help Dabhol terminal to receive LNG tankers.

3. Indian LNG import surged in January by 7.9% yoy

Indian LNG import has surged during January 2023 by 7.9% year on year basis. India's LNG imports in January came in at 2.26bn cubic meters (1.67mn metric tons), up 7.9% year/year, according to Petroleum Planning and Analysis Cell (PPAC) of Ministry of Petroleum and Natural Gas.

The cumulative imports of 22.66bn cubic meters in the first ten months of the year were lower by 14% compared with the corresponding period of the previous year.

The LNG imports cost $1.6bn last month versus $1.3bn in the same month of the previous year, PPAC said.

Indian LNG import will surge further from February onward as current spot price level of around $15 is widely acceptable among most industrial end-users. Indian buyers are expected to issue buy tenders for delivery during summer months when state-owned and private power companies experience sudden spike in demand for electricity. Among importers, state-owned GAIL India, Petronet LNG, Indian and GSPC are expected to issue series of buy tender to take advantage of the lower prices.

European LNG demand has remained subdued because of around 64% gas reserves which is far better compared to previous year and warmer weather conditions.

Among South Asian buyers, India and Bangladesh had nearly stopped buying spot LNG cargoes since middle of last year. Bangladesh has already secured two spot cargoes- one each for February and March and it is expected to buy at least five to six more cargoes by May or June.

Europe Union's decision to replace Russian piped gas with LNG, had resulted into an extraordinary spike in spot prices during 2022 following Russia-Ukraine war and subsequent drastic cut in piped gas supply from Russia to Europe.

4. Cheniere Energy proposed to expand Sabine Pass Liquefaction capacity by 20mtpa

Cheniere Energy Partners, L.P., a subsidiary of Cheniere Energy, Inc., has initiated an expansion of its Sabine Pass Liquefaction project by 20mil mt/year.

Sabine Pass LNG currently has six liquefaction trains with the total capacity of 30mil mt/year.

Cheniere Energy announced that it has initiated the pre-filing review process under the National Environmental Policy Act with the Federal Energy Regulatory Commission (FERC) for the proposed Sabine Pass Stage 5 Expansion Project, adjacent to the existing Sabine Pass Liquefaction Project. The SPL Expansion Project is being designed for total production capacity of approximately 20mil mt/year of LNG.

The SPL Expansion Project is being designed to include up to three large-scale liquefaction trains, each with a production capacity of approximately 6.5 mtpa of LNG, a boil-off-gas ("BOG") re-liquefaction unit with an approximate production capacity of 0.75 mtpa of LNG, and two 220,000m^3 LNG storage tanks.

The SPL Expansion Project is being designed with accommodations for waste heat recovery as well as carbon capture from acid gas removal units.
The SPL Expansion Project is expected to benefit from the significant existing infrastructure at the SPL Project and contemplates various enhancements to its current capabilities, including optimized ship loading at the existing marine facilities. Feed gas related to the SPL Expansion Project is expected to be transported via a combination of new and existing pipelines currently supplying the SPL Project.

Cheniere Partners has engaged Bechtel Energy, Inc. to complete a Front-End Engineering and Design (FEED) study of the SPL Expansion Project.

SPL expansion has offered a window to many Asian and European buyers, looking for long term supply options to meet their fuel requirement. European and Asian buyers struggled a lot for LNG supply throughout 2022, following Russia-Ukraine war. Cheniere's SPL expansion also supports long term bullish views in LNG business as predicted by Shell last week.

5. Hoegh Giant FSRU to go to Brazil on 10 year contract

Hoegh Giant, floating regasification unit (FSRU) of Hoegh LNG, is scheduled to go to Brazil on ten-year charter contract with TSRP/Compass. TSRP is a subsidiary of Compass Gas & Cosan Group company of Brazil.

The 170,000cbm FSRU Hoegh Giant was originally assigned to H-Energy of India for its Jaigarh LNG terminal. The contract was

terminated by Hoegh LNG in April 2022 as according to Hoegh, H-Energy defaulted on the contractual terms.

All three FSRUs of Hoegh LNG completed the preparations at the yard during the last quarter of 2022, and the two 10-year time charter contracts with the Federal Government of Germany were signed in December and January respectively. Hoegh stated in its report that FSRU Höegh Esperanza and FSRU Höegh Gannet are allocated to these two contracts and are already in place in Germany, located in Wilhelmshaven and Brunsbüttel.

The third FSRU, Höegh Giant, left the yard in November, and is now operating in the LNG carrier market on an interim charter before it is scheduled to go to Brazil in the second quarter of 2023 and commence operations under Höegh LNG's 10-year time charter contract with TSRP/Compass as mentioned earlier.

According to Hoegh, the fleet delivered a stable operating performance in the fourth quarter. However, each of Höegh Esperanza, Höegh Gannet, and Höegh Giant were idle for a period of about 35 days on average, while finalising the class renewals and modifications to be carried out to prepare the vessels for FSRU operations.

Höegh Esperanza successfully commenced regas operations in Wilhelmshaven in late December 2022 and is on hire under its new contract. Höegh Gannet arrived in Brunsbüttel in January 2023 when hire started to accrue under its new contract. The FSRU is expected to complete its commissioning and commence regas operations in March/April 2023.

FSRU Neptune, which is employed on a long-term charter with TotalEnergies, successfully commenced regas operations for Deutche ReGas in Lubmin, Germany, during January/February 2023.

The Hoegh group's fleet consists of ten modern FSRUs and two LNG carriers. The entire fleet is either operating under or committed to long-term contracts with strong counterparties.

6. **GAIL India issues buy tender for three cargoes to be delivered to Dabhol terminal**

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7. US to become leading LNG exporter in 2023 says Wood Mackenzie

High prices and the demand for energy security will drive the US to be the leading exporter of LNG in 2023 and potentially pave the way for $100 billion in new developments to support long-term growth, according to a new report from Wood Mackenzie.

In 2022, the US was the third-largest exporter of LNG at 76.4 million metric tonnes per annum (mmtpa). With the resumption of the Freeport facility, the US will surpass Qatar and Australia this year to export 89 mmtpa. However, it won't stop there. Wood Mackenzie predicts that based on the combination of projects already under construction and momentum of potential projects, US LNG capacity could grow between 70 mmtpa and 190 mmtpa before the end of the decade, potentially more than doubling current exports.

To achieve this, a slew of new projects will have to launch, which could lead to as much as $100 billion in new projects in the next five years.

"Record-high prices and the need for energy security drove buyers, which included portfolio players and US producers and infrastructure companies, to seek long-term US LNG deals in 2022 and created huge contracting momentum for projects," said Giles Farrer, head of gas and LNG asset research for Wood Mackenzie. "Last year alone, 65 mmtpa of long-term US deals were signed, dwarfing the 18.5 mmtpa we saw in 2021. This activity has pushed a host of pre-final investment decision (FID) US projects forward and we could see a wave of FIDs this year and next."

According to Farrer, projects will be undertaken by both privately and publicly-owned developers and most pre FID projects are currently seeking external financing for this investment. "In most cases, project financing will support between 60-80% of the required capital, with the remainder either financed via equity raises and/or balance sheets." he added.

Risks to capacity growth:

The potential for cost increases is challenging developers as they move forward, particularly through supply-chain-triggered inflation and competition for resources.

“Our benchmarking analysis indicates we have already seen inflation of over 20% on the US Gulf Coast, compared to projects which were built in the last five years,” said Sean Harrison, research analyst, gas and LNG for Wood Mackenzie. “As developers continue to push more projects forward, competition for service contracts will rise, creating a squeeze on both work force and material prices. This could cause further cost inflation, along with delays to some projects.”

Harrison added that despite rising costs, competition for customers is keeping liquefaction fees low, potentially between $2-$2.5 per million British thermal unit for fixed price long-term agreements, challenging profitability.

“The combination of low fees and increasing costs mean we estimate unlevered internal rates of return (IRRs) as low as 5-6% for some projects. Based on these returns, some projects are finding it challenging to secure finance, particularly via equity raises,” said Harrison. “Projects are looking for ways to create additional value for developers and equity investors. Ways they might find upside include procuring feedgas efficiently, securing good prices for uncontracted LNG sales, debottlenecking and re-rating of trains and the sale of pre-commercial volumes. Charging customers for additional services to reduce project emissions could also deliver additional returns.”