



POLAND SHORTLISTS BW LNG AND MOL FOR FIRST FSRU NEWBUILDS

Some famous names in floating regasification miss out on Gaz-System business. Poland gas transmission operator Gaz-System has shortlisted two shipowners to build the country's first floating storage and regasification unit. Sources following the tender process closely told TradeWinds that BW LNG and Mitsui OSK Lines are left battling it out for the business. They said their selection to move forward in the process means that earlier bidders — including experienced floating regas names like Excelerate Energy, Hoegh LNG and Exmar working in partnership with Hanwha Ocean and would-be FSRU entrant Knutsen LNG — have not made it through to the final round. Gaz-System is expected to make a final choice on its preferred owner for the FSRU before the end of this year. BW LNG has added five FSRUs to its fleet with the units, a mix of purpose-built vessels and LNG carriers-to-FSRU conversions, currently employed in Egypt, Brazil, Pakistan, El Salvador and the Philippines. In contrast, MOL has had a diverse and eclectic mix of experience in FSRUs. The company built the world's largest regas unit, which, after something of an odyssey of project work that saw it deployed as both an LNG carrier and FSRU after the original business it was built for collapsed, is now serving as Hong Kong's first regas unit – the 263,000 Bauhinia Spirit (ex-FSRU MOL Challenger, built 2017). Aside from this, the company also partnered on building the 180,000-cbm FSRU Vasant

1 (built 2020), which is now working for Botas in Turkey. In addition, MOL has teamed with Turkey's Karpowership to form KARMOL and has already converted three LNG carriers into FSRUs to supply the powerships as they switch over to burning gas, with several more conversions in the system. Gaz-System left the door open for offers on a newbuilding, an existing vessel or conversion in its tender, and it is not yet clear which route bidders took. With newbuilding prices at record highs, an enquiry for a new FSRU is something of a rarity. Brokers and yards suggested the price could be upwards of \$350m. Most recent transaction, The last done deal was by Exceleerate, which booked a 170,000-cbm FSRU at HD Hyundai Heavy Industries in October 2022, priced the unit at around \$337m. Poland's FSRU has been in the works since at least 2016 but has only gained real traction in the wake of Russia's invasion of Ukraine 18 months ago. Initial offers for the unit were submitted on 25 August 2023, after which some bidders left the process with full commercial bids invited in September. Gaz-System has asked for the FSRU to be delivered by August 2027 to be ready to start commercial operations in early 2028. The unit is to be located in Gdansk Bay in northern Poland. An open-season procedure for the unit's regasification capacity resulted in Polish energy company Orlen signing a contract in August for 100% of the 6.1bn cbm regasification capacity at the FSRU. In June, offers were requested on a Phase 2 expansion that could involve the installation of a second FSRU if there is sufficient interest from domestic and regional buyers. Gaz-System management board vice president Andrzej Kensbok said in August: "If it goes well, we could launch a second FSRU unit, which would increase the regasification capacity by 4.5bn cbm of gaseous fuel annually." Poland has one existing land-based LNG import facility, the President Lech Kaczynski LNG Terminal in Swinoujście. Source : www.tradewindsnews.com

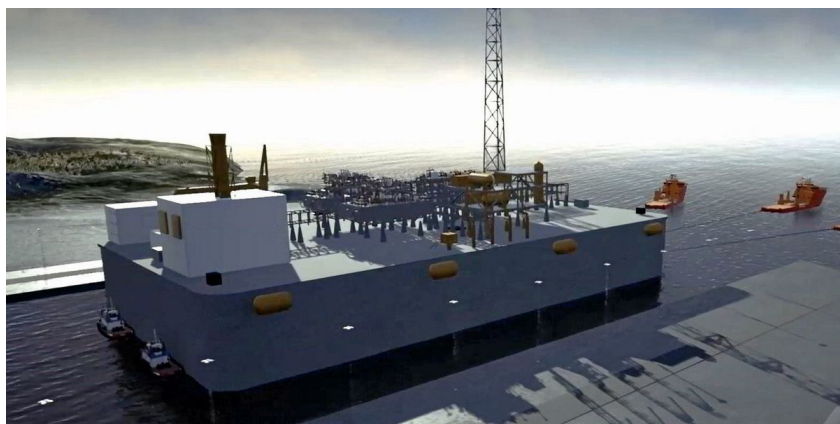
DYNAGAS FSRU STARTS CHARTER TO DEUTSCHE REGAS AS GERMANY JUGGLES REGAS VESSELS

But unit is being chartered out as an LNG carrier before it starts regas role. One of Dynagas' two floating storage and regasification units has started its charter with Germany's Deutsche ReGas but will work as an LNG carrier if required for FSRU duties. Lubmin-based Deutsche ReGas said it had taken delivery of the 174,000-cbm Transgas Power (built 2021). It said the vessel, which has a regasification capacity of up to 7.5 bcm of gas per annum, is one of the two FSRUs planned for the Deutsche Ostsee terminal in the port of Mukran on Ruegen Island in the Baltic Sea. Deutsche ReGas said Transgas Power will be moored at berth 12 in the port this winter and put into operation as an FSRU. Gascade is building a new pipeline to link the terminal to the onshore grid from the first quarter of 2024. But the project has met local opposition and legal challenges. In the interim, to it being used as an FSRU, the Transgas Power will be chartered out and used as an LNG carrier. The terminal company said on Friday that the FSRU is already on its way to the Baltic Sea and is expected to arrive at the Deutsche Regas-operated LNG Terminal in Lubmin at the end of next week. The German government wants the 145,130-cbm FSRU Neptune (built 2009), currently at Lubmin, moved to Mukran to work alongside the Transgas Power. This would free up the complex array of floating storage units and small-scale ships that currently supply volumes to the Neptune. Deutsche

ReGas managing director Ingo Wagner said the delivery of the Transgas Power marked another “important step” toward the realisation of the Mukran terminal. “Together with our partners, we are pleased to have found this interim solution until the FSRU is operational. This means that we can already use the vessel, which is only two years old, to stabilise the security of supply for natural gas.” Germany put three FSRUs into operation last winter at Wilhelmshaven, Brunsbuettel and Lubmin ports. It rushed to provide quick start-up import solutions for LNG after Russia stopped pipeline gas supplies to Europe. More FSRUs are due to be added at Wilhelmshaven, Mukran and Stade during the 2023 to 2024 winter period. Sister ship Transgas Force has been designated as the FSRU that will be moored at Bremerhaven on the River Elbe in January for the Stade project. The German government also plans to transition to using green hydrogen at some of the sites. source : www.tradewindsnews.com

CROWN LNG REINVENTS OFFSHORE REGAS AS IT PURSUES FSRU FOR SCOTLAND

Company is reviving gravity-based structure concept as it files for US listing, Infrastructure company Crown LNG wants to use gravity-based structures to advance weather and environmentally challenged LNG terminal projects — but the organisation is also working on conventional floating storage and regasification in parallel. Crown LNG, which was created by former LNG colleagues in 2016, is now pursuing its first GBS LNG terminal for Kakinada in India while also moving forward with a conventional floating storage and regasification unit for Grangemouth in Scotland. Crown LNG chief executive Swapan Kataria is unsure which one will come to market first. But he told TradeWinds that infrastructure for liquefaction or regasification is “essentially one of the biggest bottlenecks” that the industry has had. Kataria is passionate about the future use of GBS — a concrete structure on the seabed with storage tanks inside and a liquefaction or regasification kit on its surface — both for LNG production and terminals. He stresses that Crown LNG is not competing with those building land-based terminals or FSRUs, but it is only going into areas where floating projects have failed because of technical challenges. Crown LNG has settled on India — a large and emerging LNG buyer — for its first terminal, but it is also building a pipeline of projects in the background.



Aside from its job in Scotland, the company has also identified a potential GBS LNG terminal project for Vietnam and is eyeing up a possible liquefaction development that could use its technology off Newfoundland in eastern Canada. But development work and building out the reach of a relatively new business takes cash, and Kataria said the company is trying to raise \$50m for its first two projects.

Crown LNG is in the process of combining its business with US-listed special purpose acquisition company Catcha Investment Corp so that it can reverse in the outfit's New York Stock Exchange listing. The two companies filed a registration document with the US Securities and Exchange Commission in August and hope to see the venture listed early in 2024 under the ticker "CGBS".

LNG roots

Crown LNG's roots are with Argo LNG, which was planning a liquefaction project in the Gulf of Mexico about 10 years ago. Kataria said this is where the concept of using GBS really began to sink in as the terminal was in a hurricane zone, where a floating unit could not work, and regulatory authorities were taking years to approve land-based projects. But the project did not have buyers, and its licence ran out. Now Crown LNG is moving ahead with plans for a \$1bn, 7.2-million tonnes per annum GBS regasification unit — or GBSRU — terminal project on India's east coast, where it is difficult to find sufficient draught for an FSRU. Wave heights rule out a barge concept, and the cost of dredging for ship access would prove prohibitively expensive. An FSRU project for Kakinada was attempted before it was put up for sale in 2016. Crown LNG's GBSRU would be located 19 km (12 miles) off Kakinada Port in 20 metres of water linked to the shore by a buried pipeline and capable of operating year-round. Crown LNG has acquired an Indian company — KGL&G — that holds the licence for the project. It is working with Aker Solutions, Wartsila Gas Solutions and Siemens Energy on the project. Crown LNG plans to build the GBS near the final site using a temporary drydock to limit the towing distance.

Next generations

After its capital raise, Kataria said it will take Crown LNG between 18 and 24 months to reach a final investment decision — targeted for August 2025 — on the project and then three years to build and commission the facility, which could see the terminal in operation by March 2028. While the price tag on Kakinada might sound steep, Kataria said it would simply be a matter of modifying the foundation or what Crown LNG calls the "LNG island", which would likely reduce the cost of subsequent developments. "This is the first project where we actually want to prove again that GBS works in harsh weather," he said.

Kataria added that the GBS technology has existed since the 1970s. One GBS LNG terminal project in operation — Adriatic LNG in Italy — has been in place since 2009. He said Crown LNG saw around 20 other locations in the world that wanted LNG but could not get it as there was no possibility of building a land-based terminal, and an FSRU could not operate there. "That's when it clicked for us that it's an opportunity which can go global," he said. Looking to the end of the decade, Kataria said Crown LNG's ultimate goal is to get into liquefaction to give it molecules. But, today, it is spending the bulk of its time on regas because that is where the demand is right now. He calls Crown LNG's GBS liquefaction and regas designs the generations one and two. "I think my goal is to do a Gen 3, where we can have an integrated power plant," he said. "Gen 4, which we want to develop, is really for green hydrogen to green ammonia." Source : www.tradewindsnews.com

KNUTSEN KEEPS ALL OPTIONS OPEN TO DELIVER SCOTLAND'S \$533M FSRU

Crown LNG kicks tyres on 170,000-cbm carrier and likely conversion candidates, Soon-to-be-US-listed Crown LNG is working on plans to site a \$533m floating storage and regasification unit close to Grangemouth Port in Scotland's Firth of Forth. The company has entered an agreement with GBTRON Lands for an offshore site, where it plans to locate a five-million tonnes per annum FSRU spread-moored in sheltered waters. Under the original plans, the FSRU would have been used to supply a power plant that GBTRON Power plans to build. But talks are taking place with the Scottish government as to whether the regas unit could supply gas directly to the grid. Crown LNG has been looking at the options for providing an FSRU for the project. Company president Gunnar Knutsen said a newbuilding could not be delivered until 2028 or 2029, which is outside the project's timeline. He said the obvious alternative is an LNG carrier-to-FSRU conversion, which he added should be achievable in three years from sourcing the vessel. Knutsen said Crown LNG is looking for a 170,000-cbm to 174,000-cbm modern LNG carrier for its conversion to give it flexibility on storage. At present, the company is looking at the options on this, talking to shipyards and owners with vessels. "We need to keep all the alternatives open," he said. Crown LNG is expected to list on the New York Stock Exchange in early 2024 through a business combination with US-listed Catcha Investment Corp. Investment decision Once this is in place, the company has said it plans to start a pre-application consultation process for the project, which it expects to take between three and six months. In its registration document filed with the US Securities and Exchange Commission, Crown LNG said it is targeting a final investment decision for the Grangemouth FSRU project for August 2024. Knutsen indicated that Crown LNG could move forward on sourcing an LNG carrier for the conversion, a yard to undertake the work and suppliers of the main regas kit pre-FID, but that final contracts would only be signed once the investment decision has been taken. He anticipates that the FSRU could be in place by 2027. source : www.tradewindnews.com

TOTALENERGIES: LE HAVRE FSRU STARTS SENDING GAS TO FRENCH GRID

France's first floating storage and regasification unit (FSRU) in Le Havre has started delivering natural gas supplies to the grid, according to TotalEnergies. TotalEnergies announced the commissioning of the 2010-built 145,130-cbm FSRU Cape Ann in a statement on Thursday. "The terminal injected its first megawatt-hours (MWh) of gas into the grid operated by GRTgaz, using LNG from Norway," the firm said. TotalEnergies charters this 283 meters long vessel from Hoegh LNG, which has a 50 percent stake in Cape Ann and Japan's MOL, which owns a 48.5 percent stake. Tokyo LNG Tanker holds a 1.5 percent share in the unit. LNG Prime reported on September 12 that the FSRU took a cargo off Gibraltar via a ship-to-ship operation with the LNG carrier Seapeak Arwa. Prior to that, Seapeak Arwa loaded the shipment at Equinor's Hammerfest LNG export plant in Norway where TotalEnergies has a stake. Following this transfer, Cape Ann berthed on September 18 at the "Bougainville Sud" dock in the Le Havre port.

LNG carrier to arrive in November

TotalEnergies has contracted 50 percent of the Le Havre terminal's annual capacity of around 5 billion cubic meters, to supply it with LNG from its global portfolio. The remaining capacity will be marketed according to rules approved by the regulator, it said. A spokesperson for TotalEnergies told LNG Prime on Thursday that the terminal is ready to start commercial operations. "TotalEnergies LNG Services France is preparing delivery of the first commercial LNG cargo scheduled in November," the spokesperson said. This is France's first FSRU-based facility and the fifth LNG import terminal. France currently hosts four onshore LNG terminals with a capacity of about 26.8 mtpa. These are Elengy's Fos Tonkin, Fos Cavaou, and Montoir-de-Bretagne LNG terminals, and also the Dunkirk LNG facility. source : www.lngprime.com

BANGLADESH APPROVES LONG-TERM LNG SUPPLY DEAL WITH EXCELERATE

Bangladesh has reportedly approved a long-term liquefied natural gas (LNG) supply deal with US FSRU player Excelerate Energy. Several media reports in Bangladesh said on Wednesday that the country's Cabinet Committee on Public Purchase, led by the by the finance minister, has approved the draft LNG SPA between state-owned Petrobangla and a unit of Excelerate. According to the reports, Excelerate would supply 0.85 mtpa of LNG in 2026-2027 and 1 mtpa from 2028-2040 under the 15-year deal. The price per million British thermal units would be \$0.30 per MMBtu plus 13.35 percent of the Brent price on the delivery date, the reports said. Bangladesh also approved the increase in the capacity of its first LNG import facility, Moheshkhali Floating LNG or MLNG, operated by Petrobangla, from 500 million standard cubic feet of gas per day to 600 MMscf/d, the reports said. This facility and Summit Group's FSRU-based terminal both feature Excelerate's FSRUs. In addition to these facilities, Excelerate is also working on another FSRU-based facility in Bangladesh, the Payra LNG project. Excelerate signed US LNG supply deal earlier this year CEO Steven Kobos said in August during the company's second-quarter results call that Excelerate aims to sign a long-term deal with Bangladesh in the upcoming period after the country's government approved in principle the signing of the SPA. He said that he company previously reported that both the Payra deal and the first supply deal were "working their way through the bureaucratic system, and we're pleased that it's reached that point." Kobos said at the time that the company would issue a press release when it actually signs the definitive deal. Earlier this year, Excelerate signed a 20-year deal to buy 0.7 mtpa of LNG on a free on board (FOB) basis from Venture Global's Plaquemines LNG facility in Plaquemines Parish, Louisiana. "In addition to the 20-year LNG sales and purchase agreement we announced earlier this year with Venture Global, we're also considering additional SPAs with other LNG producers," Kobos said in August. Exclerate currently operates ten FSRUs, one of the world's largest fleets of such vessels, and these units are located around the globe, including in Europe and in Brazil. The firm also ordered one FSRU in South Korea last year. source : www.lngprime.com

GERMAN FSRU TERMINAL OPERATOR ALLOCATES 2024 REGAS SLOTS

State-owned LNG terminal operator Deutsche Energy Terminal has allocated 60 regasification slots at two of its FSRU-based terminals in Germany. DET has for the first time marketed regasification capacities of the terminals it operates in digital auction

Terminal	Product	Month	Product Label	Marketable Slots	Marketed Slots	Average Price (Eurocent/MMBtu)
Brunsbüttel 01	Obligation to deliver	April	0424-BBU-OTD	1	1	58
		May	0524-BBU-OTD	1	1	58
		June	0624-BBU-OTD	2	2	58
		July	0724-BBU-OTD	1	1	58
		August	0824-BBU-OTD	1	1	58
		September	0924-BBU-OTD	1	1	58
		October	1024-BBU-OTD	2	2	58
		November	1124-BBU-OTD	1	1	58
		December	1224-BBU-OTD	2	2	58
		Brunsbüttel 01	No Obligation to deliver	April	0424-BBU-NOTD	1
June	0624-BBU-NOTD			1	1	58
July	0724-BBU-NOTD			2	2	69,6
August	0824-BBU-NOTD			2	2	69,6
September	0924-BBU-NOTD			1	1	58
October	1024-BBU-NOTD			1	1	72,1
Wilhelmshaven 01	Obligation to deliver	April	0424-WHV-OTD	2	2	55
		May	0524-WHV-OTD	2	2	64,86
		June	0624-WHV-OTD	2	2	55
		July	0724-WHV-OTD	2	2	55
		August	0824-WHV-OTD	2	2	55
		September	0924-WHV-OTD	2	2	55
		October	1024-WHV-OTD	2	2	55
		November	1124-WHV-OTD	2	2	55
		December	1224-WHV-OTD	2	2	55
		Wilhelmshaven 01	No obligation to deliver	April	0424-WHV-NOTD	1
May	0524-WHV-NOTD			1	1	68,1
June	0624-WHV-NOTD			3	3	66
July	0724-WHV-NOTD			1	1	72
August	0824-WHV-NOTD			3	3	65,03
September	0924-WHV-NOTD			1	1	66
October	1024-WHV-NOTD			1	1	68,1
November	1124-WHV-NOTD			1	1	66
December	1224-WHV-NOTD			1	1	68,1
Wilhelmshaven 01 10% mandatory share	No obligation to deliver			May	0524-WHV-M-NOTD	1
		July	0724-WHV-M-NOTD	1	1	77
		September	0924-WHV-M-NOTD	1	1	66
		November	1124-WHV-M-NOTD	1	1	78,1
		December	1224-WHV-M-NOTD	1	1	66,5
Brunsbüttel 01 10% mandatory share	No obligation to deliver	May	0524-BBU-M-NOTD	1	1	69,6
		July	0724-BBU-M-NOTD	1	1	69,6
		September	0924-BBU-M-NOTD	1	1	58
		November	1124-BBU-M-NOTD	1	1	81,2

rounds. On a total of six marketing days, from October 16 to 19 and October 23 and 26 October, market participants were able to book time slots for the use of regasification capacities in the period from April to December 2024 at the Brunsbüttel and Wilhelmshaven 1 sites. DET said in a statement on Thursday that it has allocated both slots with and without delivery obligations to traders. “All of the 60 slots on offer were awarded

at prices between 55 and 81.2 Euro cents/MMBtu. This will ensure full capacity utilization of the two terminals for 2024,” DET said. New player in the market “We are very pleased that we were able to realize the first marketing round under great time pressure and the challenges of the newly established DET,” said **Peter Röttgen**, managing director of DET. Moreover, Röttgen said that DET’s offer had been “well received by shippers and we have established ourselves as a new player in the market.” “As expected, the fact that all the slots we offered were marketed confirms that there is demand in the gas market,” he said. DET is planning to commission its facility in Stade and also the second terminal in Wilhelmshaven in Q1 2024. Also, the firm aims to hold short-term capacity auctions for these terminals in December this year. DET plans to hold capacity auctions with terms of more than one year for all four facilities in April 2024. Germany’s Federal Ministry for Economic Affairs and Climate Action established Düsseldorf-based DET in January to manage FSRU-based LNG import terminals. The German government, helped by Uniper, RWE, and TES chartered in total five FSRUs from Hoegh, Dynagas, and Excelerate Energy. Also, the

government sub-chartered the FSRU Transgas Power, owned by Dynagas, to private firm Deutsche Regas. This FSRU will serve the planned LNG import terminal in the port of Mukran. [source : www.lngprime.com](http://www.lngprime.com)

ENI INKS THREE-YEAR DEAL FOR INDONESIAN LNG SUPPLIES

Italian energy firm Eni has signed a three-year liquefied natural gas sales and purchase agreement with Merakes LNG Sellers to secure more LNG volumes from Indonesia. The deal is for 0.8 billion cubic meters (bcm) of LNG per year and starts from January 2024, Eni said in a statement. Back in 2021, Eni started gas production from the Merakes project offshore Indonesia. Gas supplies from the field will help extend the life of Pertamina's Bontang LNG facility in East Kalimantan. Earlier this year, a unit of energy trader Vitol also signed a three-year deal with the Merakes LNG Sellers to offtake volumes from the Bontang LNG facility. Merakes is part of the East Sepinggan PSC, jointly owned by Eni, Neptune Energy, and Pertamina. The Bontang LNG plant launched liquefaction operations in the 1970s and has been supplying LNG ever since, primarily to Asian markets.

Boosting LNG supplies

Besides the new deal, Eni has a contract with Jangkrik LNG Sellers for 1.4 billion cubic meters per year, in place since 2017. "Thanks to these new volumes, Eni can ensure greater flexibility and further diversification of its LNG supplies, while strengthening its presence in growing markets such as South Asia and the Far East," the firm said. The new contract follows the long-term contract recently signed with the Marine XII JV in Congo for LNG volumes of about 4.5 bcm, and the contract with QatarEnergy for up to 1.5 bcm of LNG from the North Field East project, Eni said. Eni said the contract contributes to the buildup of its LNG portfolio by leveraging "strong relationships" with the countries of operation. The firm aims to more than double its contracted LNG volumes to over 18 million tonnes per year (mtoa) by 2026, leveraging integration between upstream and gas marketing activities, it added. [source : www.lngprime.com](http://www.lngprime.com)

TOTALENERGIES SAYS Q3 LNG EARNINGS DIP DUE TO LOWER PRICES

France's TotalEnergies said on Thursday that the company's integrated LNG business logged a decline in its adjusted net operating income in the third quarter of this year due to lower prices. The company's integrated LNG adjusted net income reached about \$1.34 billion in the third quarter, a drop of 61 percent when compared to the third quarter in 2022 and a slight rise when compared to \$1.33 billion in the previous quarter. TotalEnergies attributed the drop mainly due to lower LNG prices, as well as "exceptional" trading results in the third quarter 2022, partially offset by higher production. Cash flow from operations excluding working capital (CFFO) for integrated LNG was \$1.65 billion in the third quarter, down 34 percent year-on-year (excluding Novatek), mainly due to lower LNG prices, it said. Earlier this month, TotalEnergies reported a drop in its average price for LNG equity sales in the third quarter. The average LNG price was \$9.56/MMBtu in the July-September period, logging a decrease when compared to \$9.84/MMBtu in the previous quarter. Also, the price nosedived compared to



\$21.51/MMBtu in the July-September period last year, when European demand surged as European countries worked to replace pipeline gas supplies with LNG. Overall, TotalEnergies reported adjusted net income of \$6.45 billion in the third quarter. This compares to \$4.95 billion in the prior quarter and \$9.86 billion in the same quarter last year. “While implementing its balanced transition strategy that combines oil and gas and integrated power, TotalEnergies demonstrates once again this quarter its ability to leverage a supportive price environment, generating adjusted net income of \$6.5 billion and return on average capital employed of over 20 percent,” chief executive **Patrick Pouyanne**, said. He said that cash flow from operations increased to \$9.3 billion in the third quarter and totaled \$27.4 billion in the first nine months of 2023. In the oil and gas business, production at nearly 2.5 Mboe/d is up 5 percent year-on-year, thanks to the start-up of several oil projects in Brazil and Iraq and gas projects in Oman and Azerbaijan, the CEO said. “Integrated LNG confirms the robustness of its global integrated portfolio, with adjusted net operating income of \$1.3 billion and cash flow of \$1.6 billion,” Pouyanne said. The company’s board decided the distribution of the third interim dividend for the 2023 financial year in the amount of €0.74/share, up 7.25 percent year-on-year, the CEO added.

LNG sales

During the third quarter, TotalEnergies sold 10.5 million tonnes of LNG, slightly up when compared to 10.4 million tonnes in the same period last year, and a drop compared to 11 million tonnes in the prior quarter. TotalEnergies said LNG sales stabilized year-on-year and decreased quarter-to-quarter, due to the decrease in spot traded volumes in a “less volatile” environment. During January-September, LNG sales decreased by 8 percent to 32.5 million tonnes. Hydrocarbon production for LNG, excluding Novatek, stabilized quarter-to-quarter and was up by 18 percent year-on-year to 433 kboe/d mainly to due to a planned maintenance impacting production at Ichthys field in the third quarter 2022, it said. Also, hydrocarbon production for LNG dropped by 3 percent in the January-September period to 445 kboe/d, the firm said. Average LNG price in Q4 above \$10 per MMBtu “Despite entering the winter period with high natural gas inventories in Europe, in a tense market, gas prices remain very reactive to production disruptions,” TotalEnergies said. Given the evolution of oil and gas prices in recent months and the lag effect on price formulas, TotalEnergies anticipates that its average LNG selling price should be above \$10/MMbtu in the fourth quarter. TotalEnergies expects hydrocarbon production to range between 2.4 and 2.5 Mboe/d in the fourth quarter, which reflects the impact of the sale of its oil sands assets in Canada. The company confirmed 2023 guidance of net investments between \$16 and \$17 billion. source : www.lngprime.com

CROWLEY PLANS TO LAUNCH PANAMA CANAL LNG BUNKERING OPS IN 2024

US shipping and logistics company Crowley plans to start providing liquefied natural gas (LNG) bunkering services on the Pacific side of the Panama Canal in 2024. The firm will deliver LNG via ship-to-ship transfers to LNG-powered vessels under the first permit issued by the Panama Maritime Authority (AMP) for the provision of such services, it said in a statement. With



a potential start date in 2024, Crowley is preparing to provide bunkering and related port solutions to deliver “lower-emission” LNG to vessels for fuel and cryogenic tank cooldown services at the canal, it said. “LNG is widely accepted as the most practical transitional alternative fuel for maritime shipping and to stay ahead of the rapid deployment of LNG-powered ships across the

global market, Crowley is strategically growing its LNG bunkering operations across North and Central America,” **James Fowler**, senior VP and general manager, Crowley Shipping, said. “The Panama Canal will become a key location for vessels to take on LNG, and Crowley’s future Panamanian bunkering service will give international ship owners confidence to continue to adopt LNG across their fleets,” Fowler said. The Panama Canal location expands Crowley’s LNG solutions. In 2014, Crowley received the first small-scale LNG export license from the US Department of Energy for LNG transportation from the US into FTA and non-FTA countries. The company then pioneered small scale LNG transportation and engineering to Puerto Rico, it said in the statement. Crowley’s services expanded in 2022 with the opening of an LNG truck loading terminal in Peñuelas, Puerto Rico. In addition, a 12,000-cbm LNG bunker barge, the largest in the US, is under construction with a long-term charter agreement with Shell to begin service in 2024 for ships on the US East Coast, Crowley said. US-based Fincantieri Bay Shipbuilding is building Crowley’s large LNG bunkering barge. source : www.lngprime.com

HUDONG-ZHONGHUA KICKS OFF WORK ON NEW COSCO LNG CARRIER

Chinese shipbuilder Hudong-Zhonghua has started building a new LNG carrier for Cosco Shipping Energy Transportation and PetroChina. CSSC’s Hudong-Zhonghua held a steel-cutting ceremony on October 23 for the LNG carrier with a working name H1908A, it said in a statement. This is the first of two 295 meters long LNG carriers the Chinese shipbuilder will build under the third stage of the Cosco Shipping-PetroChina project. United Liquefied Gas Shipping, a joint venture in which Cosco Shipping has an 81 percent stake and partner PetroChina holds the rest, ordered these two LNG carriers in July this year.

The delivery of the two vessels is expected to take place in the second half of 2025 and the first half of 2026. Also, the vessels will have WinGD X-DF dual-fuel engines and GTT's NO96 L03+ containment system, such as the previous six ships under the PCI program. Hudong-Zhonghua delivered the first and the second LNG carrier under the PCI project, Shaolin and Wu Dang, last year, and the third carrier, Kun Lun, in March this year. Earlier this year, the shipbuilder launched the fourth LNG carrier and on October 15 launched the the fifth LNG carrier in this batch. source : www.lngprime.com

ACCELERATING LNG PRODUCTION ACROSS ASIA PACIFIC

Black & Veatch president, Asia Pacific and India, Narsingh Chaudhary, explains why LNG has become a key component in the region's journey towards a more sustainable future. The need to balance short-term energy needs and long-term environmental imperatives has become more pressing as the world's economies transition from carbon-intensive activities to cleaner energy sources. Many nations in the Asia Pacific are particularly vulnerable, due to their heavy reliance on fossil fuels and the current energy crisis brought on by geopolitical events. The International Energy Agency (IEA) advises the region to accelerate renewable energy production to balance its aims for energy security, reliability and emissions reductions. Seamless integration of generating, transmission and distribution systems is necessary to address the complexities of the energy transition. Finding the correct mix of technology is essential to enhancing energy security and achieving ambitious regional decarbonisation goals. In this setting, LNG has emerged as a dependable base load energy source to fill the gap created by the retirement of coal-fired assets, the rapid penetration of renewable energy sources and the emergence of innovative clean energy technologies. **"FLNG's ability to release stranded and distant gas reserves is of particular value in this region"** The promise of LNG as a dependable base load energy source is evidenced by the increased demand for it, notably for large-scale gas-fired power generation throughout maritime nations in the Asia Pacific. The region's current production capability is unable to satisfy this demand, with several countries in the region still having more than 50 percent of their power generation based on coal. Increased LNG output, accelerated market entry and sustained competitive pricing are required to close this gap. For the sector to advance, innovative technological and operational solutions, like floating LNG (FLNG) and modularisation, are needed to accelerate project development, bringing supply to market faster. FLNG technology presents significant opportunities to support the increasing demand for LNG in the Asia Pacific region. FLNG's ability to release stranded and distant gas reserves is of particular value in this region, where many reserves are offshore or in remote locations. They are also being considered for nearshore scenarios as an alternative to traditional onshore facility development. Regardless of the scenario, FLNGs make it possible to quickly monetise resources, promoting economic growth and energy security. FLNGs offer an adaptable approach to meet fluctuating demand. Because FLNG facilities are modular, they are scalable, allowing operators to change production levels in response to market conditions. Furthermore, utilising modular designs and construction in shipyards lowers risks, improves the quality of construction and reduces the environmental impact. Black & Veatch has been at the forefront of FLNG

innovation, with involvement in five of the 10 FLNG projects in operation or under construction globally. This includes converting the Golar Hilli Episeyo FLNG vessel, utilising PRICO technology from Black & Veatch, a proven liquefaction process.



Golar's Hilli Episeyo FLNG vessel utilises PRICO technology from Black & Veatch (source: Golar LNG)

PRICO is adaptable for use in small-, mid- and large-scale facilities because of its simplified operation and flexible configuration. It enables innovative project solutions for onshore, offshore and nearshore LNG facilities. Importing LNG is another pathway for economies in the Asia Pacific without gas production assets. Black & Veatch provides engineering services to design land-based, offshore and hybrid receiving terminals for its clients that choose this course of action.

Adapting LNG

Even while LNG is considered a bridging fuel for the energy transition, it also offers the flexibility to integrate more renewables by modifying and adapting LNG infrastructure for the emerging roles of hydrogen and ammonia in the global energy market.

“LNG has emerged as a dependable base load energy source” Ammonia is gaining attention as a stable energy carrier for hydrogen, the volumetric energy density of which makes storage and transport technically and economically challenging. Ammonia is more energy-dense than liquid hydrogen and has liquefaction capabilities similar to LNG. Deploying LNG facilities with carbon capture, utilisation and storage (CCUS) capabilities and powering upstream processes with renewable energy can further reduce overall carbon emissions. LNG facilities designed with the Asia Pacific's energy transition in mind have the potential to generate additional revenue streams by producing biogas, hydrogen and ammonia. Some of the most capittally efficient LNG solutions available today are floating solutions that leverage mid-scale train capacity made possible by PRICO, while minimising on-site work through modular execution and integrated hull storage. In comparison to conventional execution methods, nearshore FLNG significantly reduces the infrastructure, manpower and environmental constraints associated with

building onshore plants. LNG is emerging as a vital component in meeting energy security, dependability and emissions reductions goals as the Asia Pacific navigates its energy transition. Innovations like FLNG and the flexibility to adapt to emerging energy carriers like hydrogen and ammonia position LNG infrastructure to meet the region's evolving energy needs while contributing to a low-carbon future. source : www.rivieramm.com

LNG MARKET TO REMAIN TIGHT; GBS UNIT MAKES HISTORY

Activity emanating from the LNG sector has been positive of late, with various projects progressing and a steady stream of LNG carrier newbuildings expected. One of the most significant events in Q3 was the successful float-out of what is believed to be the first mass-produced gravity-based (GBS) liquefaction unit. This was successfully floated-out in early July from the Belokamenka Offshore Superfacility Construction Center (OSCC), located just a few kilometres from the Russian Arctic Circle city of Murmansk. Currently, Russian oil and gas are under sanctions, but the project, built at one of Europe's largest construction facilities, commenced before Russia's invasion of Ukraine and is part of a long-term strategic plan to exploit Russia's resources in the Arctic region. The natural gas liquefaction train series GBS is part of Novatek's Arctic LNG 2 project, for which three LNG GSB trains will be constructed with an annual capacity of 6.6M tonnes each, making a complete LNG capacity of 19.8M tonnes, along with 1.6M tonnes of stable gas condensate. The GBS will be installed at the Utrenneye field on the Gydan Peninsula as part of the Arctic LNG 2 project's resource base. While Russia may have forfeited its role as a major gas supplier to Europe, the expansion of these facilities will impact non-aligned natural gas and LNG buyers.

"The LNG market is at a critical juncture"

Speaking on the sidelines of the Gastech 2023 conference, held in Singapore, Wood Mackenzie vice president, APAC gas and LNG consulting, Mangesh Dilip Patankar, said the LNG market is at a critical juncture, with the uncertain outlook affecting pricing and contract terms significantly and widening the gap between buyer and seller aspirations. "Many LNG buyers face the challenge of ensuring LNG supply security, while keeping their procurement costs competitive and contractual terms flexible," Mr Patankar said. "Simultaneously, the terms in LNG sale and purchase agreements are also evolving as LNG trading increases," he added. According to Wood Mackenzie's LENS service, Australia and Qatar will be the biggest suppliers of LNG to Asia from 2023-2030, with volumes of more than 886M tonnes and 827M tonnes, respectively. This will account for almost 60% of the total volume of LNG delivered into Asia during this period. Mr Patankar noted the LNG market's cooling off from last year's highs means emerging buyers, particularly in Asia, are now keen to re-engage sellers. However, he warned any Asian buyers looking to re-enter the market must understand LNG's complex fundamentals and track its price volatility.

"The terms in LNG sale and purchase agreements are evolving as LNG trading increases"

"As [LNG] buyers contemplate their options, it becomes crucial for them to evaluate the mix of pricing indices in their portfolio, such as oil or Henry Hub, and whether they should also take some exposure to spot pricing/spot purchases," Mr Patankar said. Mr Patankar added that with the new wave of LNG projects not expected to make a significant impact in terms of

increased supply until 2026, the market looks set to remain tight. Wood Mackenzie's LENS data shows LNG year-on-year supply growth averaging 40M tonnes annually from 2026 to 2028, helping the global market to rebalance, which is predicted to bring prices down. Mr Patanker said this will improve gas affordability, facilitate LNG availability for Europe and enable a rebound of demand in Asia. "The outlook for the LNG market beyond 2028 is dependent on the level of liquefaction project final investment decisions within the next one to two years, as well as the pace of energy transition, in addition to several dynamic supply/demand-related factors." source : www.rivieramm.com

SINGAPORE LNG WINS APPROVAL FOR SECOND TERMINAL

Singapore LNG, the operator of the country's first LNG import terminal on Jurong Island, has secured approval from the Singapore government to develop and operate the country's second LNG import facility. Singapore's Deputy Prime Minister Lawrence Wong announced SLNG's plan to develop the second LNG terminal in Singapore on Tuesday during SLNG's 10th anniversary gala dinner. He said in a speech that the terminal would have up to 5 mtpa capacity to "meet Singapore's energy needs and enhance our energy security." "Our current LNG terminal has throughput capacity of about 10 million tonnes per annum (mtpa). Our peak utilization this year was 60 percent, so we currently still have some headroom," he said. "But this will eventually not be enough as our demand for LNG continues to grow," Wong said. With a second terminal, Singapore would be able to meet its power generation needs entirely with LNG, if necessary, Wong said. "Unlikely we will have to do so anytime soon, since we will continue to have access to piped natural gas," he said. "But having the additional capacity will be helpful; it will give SLNG the flexibility to better meet the growing LNG needs of the shipping industry and the wider region, and advance our position as an LNG bunkering and trading hub," Wong said. "We are still studying the exact size and the best way to build this terminal. All of you know that waterfront land comes at a premium in Singapore," Wong said. "So one possibility is to start with an offshore terminal at Jurong Port. Further studies are being conducted, and more details will be announced in due course," he said.

FSRU

State-owned Singapore LNG said in a separate statement it is studying a floating storage and regasification unit (FSRU) concept for the second terminal. The FSRU concept offers "greater flexibility in meeting the nation's energy security and sustainability objectives, as it could be easily redeployed to another location as a receiving terminal, if necessary," it said. Singapore LNG said it would connect the facility to Singapore's gas pipeline grid via a new onshore gas pipeline. The firm is aiming to have the second terminal operational by the end of this decade.

Singapore's first LNG terminal

Singapore's first LNG terminal on Jurong Island began commercial operations in May 2013. It currently operates with two jetties, three storage tanks of 180,000 cbm each, a fourth storage tank of 260,000 cbm, and a peak sendout capacity of around 11 mtpa. As of end September 2023, the LNG terminal has received about 430 LNG cargoes for its throughput service,

or some 26.58 million tonnes, according to Singapore LNG. It has also received close to 190 ships for its storage and reload and LNG bunkering services, and 130 ships for its gassing-up and cool-down service, it said. Additionally, the terminal has conducted 18 LNG transshipment and more than 3,730 LNG truck loading operations, Singapore LNG said. In March 2021, Singapore's Energy Market Authority appointed ExxonMobil LNG Asia Pacific, a unit of the US energy giant, and Singapore's Sembcorp Fuels as new term importers. The two firms joined the first two term importers, Pavilion Energy Singapore and Shell Eastern Trading. In order to boost competition and provide more options for gas buyers, the EMA launched a request for proposals last year to add two more LNG term importers.

Expansion plans

Singapore LNG also released a document on Wednesday saying it plans to increase the available LNG storage capacity to serve rising demand for the fuel and broaden the options for LNG trading and other businesses. "Several options are being explored in this regard, including bringing in a floating Storage and regasification unit (FSRU) which would be a relatively easier to implement option; and/or building additional storage tanks at the terminal that would be "future-ready" – equipped with membrane technology that provides the flexibility for the tanks to be used to store other greener fuels like ammonia," it said. "There are also other expansion projects in the pipeline, such as building out the tertiary jetty to enable more LNG bunkering and small-scale reload activities; and constructing a more permanent and upgraded LNG truck loading facility that can accommodate more trucks and operate more efficiently, with better equipment," the firm said.

LNG imports rose last year

According to GIIGNL data, LNG imports into Singapore increased by 0.6 million tons last year, offsetting a disruption in pipeline gas supplies from Indonesia. Singapore imported 3.7 million tons last year, a rise of 18.6 percent compared to the previous year. The chartering of additional LNG floating storage in application of temporary measures, introduced by the EMA, to secure the country's energy supply, has also contributed to LNG imports growth, it said. This includes the charter of MOL's FSRU Challenger, now renamed Bauhinia Spirit and serving Hong Kong's first LNG import terminal. source : www.lngprime.com

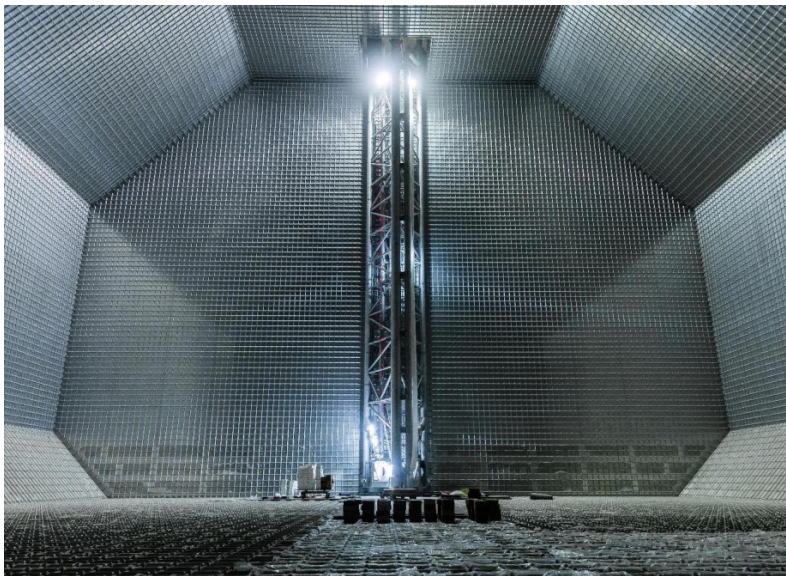
MOL AND JERA INK CHARTER DEAL FOR ANOTHER NEWBUILD LNG CARRIER

Japan's shipping giant MOL has signed a new deal to charter one newbuild liquefied natural gas carrier to compatriot LNG trading and power firm Jera. MOL said in a statement on Wednesday it has signed the long-term charter deal with a vessel operation management company funded by Jera. The LNG carrier will be managed by MOL and will transport LNG for Jera. MOL did not provide the duration of the charter. According to MOL, this is the sixth LNG carrier charter contract for the two firms and follows a deal announced in June this year. MOL said that South Korea's Samsung Heavy Industries will build the 174,000-cbm LNG carrier and deliver it in 2027. Also, the new vessel will feature MAN Energy Solutions ME-GA engine.

It will be 299.4 meters long and 46.4 meters wide. Samsung Heavy recently announced an order for one 174,000-cbm LNG carrier tied to MOL and worth about \$260 million. The shipbuilder said it will deliver this LNG carrier by September 2026. Prior to this order, Samsung Heavy secured a contract from MOL to build two LNG carriers for about \$258.5 million per vessel and two more LNG carriers for MOL for about \$248 million per vessel. Samsung Heavy will deliver these vessels in 2026-2027. source : www.lngprime.com

GTT BOOKED ORDERS FOR 52 LNG CARRIERS IN JANUARY-SEPTEMBER

French LNG containment giant GTT received orders for 52 liquefied natural gas carriers and one floating LNG producer in the first nine months of this year. GTT said in its financial report on Wednesday that deliveries of these LNG carriers are scheduled



between the first quarter of 2026 and the first quarter of 2028. The FLNG, being built at South Korea's SHI, is expected to be delivered in the first quarter of 2027. GTT won orders for 10 LNG carriers in the third quarter and 42 LNG carriers in the first half. The Paris-based firm received record 134 LNG carrier orders in January-September last year and record 162 orders for LNG carriers in 2022. Besides these LNG carriers and the FLNG, GTT received an order from Chinese shipyard Yangzijiang to design the tanks for ten LNG-powered ultra-large containerships and for five very large LNG-

powered containerships with South Korea's HD Hyundai Heavy Industries. Delivery of all these container ships is scheduled between the second quarter of 2026 and the first quarter of 2028.

LNG demand remains "particularly high"

Earlier this year, GTT's chief **Philippe Berterottière** said GTT is expecting that there will be up to 450 orders for large LNG carriers over the 2023-2032 period. Commenting on the company's January-September results, Berterottière said that with 52 orders for LNG carriers and one FLNG unit, "the commercial performance of our core business continues to be very strong." He noted that GTT booked 15 orders for LNG as fuel in the third quarter of 2023, "indicating a resumption of commercial activity as LNG spot prices stabilize." "LNG demand remains particularly high and sustainable, as illustrated by the number of final investment decisions for new liquefaction plants made since the beginning of the year, leading to additional LNG carrier needs," he said. This year's FID's include Venture Global LNG's second Plaquemines LNG phase, Sempra's Port Arthur LNG project, and NextDecade's Rio Grande LNG project.

Revenues climb

As of September 30, 2023, GTT's order book excluding LNG as fuel stood at 302 units. This includes 287 LNG carriers, 2 ethane carriers, 1 FSRU, 1 FLNG, and 11 onshore storage tanks, the firm said. Following cessation of activities in Russia, GTT removed from its order book 15 ice-breaking LNG carriers and three GBSs. With regard to LNG as fuel, the order book stood at 84 units as of September 30, 2023. These are all containerships. Moreover, GTT reported a 35.1 percent rise in its revenues for the January–September period to 300 million euros (\$318 million). Revenues for the third quarter of 2023 reached 122.2 million euros, up 57 percent compared to the third quarter of 2022, benefitting from the gradual increase in the number of LNG carriers under construction, GTT said. Newbuild revenues amounted to 272.6 million euros, up 36 percent compared to newbuild revenues for the first nine months of 2022. "Therefore, in the absence of significant delays in vessel building schedules, the group confirms its 2023 objectives, which it now expects in the upper half of the initial ranges," Berterottiere said. GTT previously said it expects 2023 consolidated revenues of between 385 million euros and 430 million euros, and 2023 consolidated Ebitda of between 190 million euros and 235 million euros. source : www.lngprime.com

DESFA ALLOCATES REVITHOUSSA LNG SLOTS FOR 2024 AND 2025

Greece's DESFA said that firms have reserved all of the offered regasification slots in 2024 and 2025 at its LNG import terminal located on the island of Revithoussa. Earlier this year, the gas grid and LNG terminal operator controlled by a consortium led by Italy's Snam said that seven users have reserved all of the available Revithoussa regasification slots in 2023. Besides the 2023 slots, 5 domestic and 3 international users have reserved 40 of the 45 available slots in 2024, while 5 domestic and 1 foreign user reserved 30 of the total 45 offered slots in 2025, DESFA said at the time. DESFA announced on Wednesday the completion of new LNG auctions for 2024 and 2025. The annual LNG scheduling auctions for the period 2024–2038 started earlier this month. DESFA said that 5 domestic and 3 international users reserved all of the 45 available slots for the unloading of 36 TWh in 2025. The reserved capacity for 2024 corresponds to 73.2 percent of the maximum regasification capacity of Revithoussa. In addition, 6 domestic and 1 foreign user reserved all of the 41 offered slots for the unloading of 35 TWh in 2025. DESFA said the reserved capacity for 2025 corresponds to 73 percent of the maximum regasification capacity of Revithoussa.

Greek LNG imports decreased this year

LNG deliveries to the Revithoussa terminal decreased 13.7 percent in the January–September period of this year compared to record 60 cargoes and 27.85 TWh of LNG in the same period last year. Deliveries from US liquefaction plants to Greece reached 9.36 TWh in the period, down 49.9 percent compared to the same period last year. The Revithoussa facility has a

storage capacity of 225,000 cbm and a regasification capacity of 1,400 cbm/h. It is currently the only LNG import plant in Greece but it will be joined this winter by Gastrade's FSRU-based LNG import project in Alexandroupolis. source : www.lngprime.com

VENTURE GLOBAL LNG COMPLETES \$4 BILLION SENIOR NOTES OFFERING

US LNG exporter Venture Global LNG said it had closed its \$4 billion offering of senior secured notes. The offering included a series of 9.5 percent senior secured notes due February 1, 2029 in an amount of \$2.5 billion and a series of 9.875 percent senior secured notes due February 1, 2032 in an amount of \$1.5 billion, according to Venture Global. Venture Global said the notes were not registered under the Securities Act of 1933, or the securities laws of any state or other jurisdictions, and the notes may not be offered or sold in the US. In May, Venture Global closed its \$4.5 billion inaugural offering of senior secured notes. Venture Global's \$4.5 billion senior secured notes offering in May and the latest offering of the notes, "represent the first and second largest high yield bond offerings in 2023, respectively," the firm said. The LNG exporter recently won approval to increase the peak workforce at the site of its Plaquemines LNG export plant in Louisiana. Earlier this year, the firm sanctioned the second phase of the Plaquemines LNG export plant in Louisiana. The full project, including the second stage, will have a capacity of 20 mtpa coming from 36 modular units, configured in 18 blocks. Together, phase one and phase two represent about \$21 billion of investment. Once online, this will be Venture Global's second LNG plant after the Calcasieu Pass plant in Louisiana. Calcasieu Pass produced its first LNG on January 19, 2022, moving from FID to LNG production in 29 months, and the first commissioning cargo left the facility on March 1. However, Venture Global has still not declared commercial operations at the facility and it recently filed with the US FERC seeking approval to put in service liquefaction blocks 7-9. source : www.lngprime.com

JOVO'S LNG CARRIER WRAPS UP GAS TRIALS

Jovo's first 79,800-cbm LNG carrier is almost ready for delivery after the completion of its gas trials, according to China's Jiangnan Shipyard. The state-owned yard located in Shanghai said in a statement that the LNG carrier Mulan Spirit has completed its gas trials on October 18. Jiangnan is now preparing to deliver China's first medium-sized LNG carrier equipped with GTT's Mark III Flex membrane containment system. The shipbuilder did not say when it expects to hand over the vessel but the delivery is expected to take place by the end of this year. Jiangnan started building this 229.99 meters long dual-fuel LNG carrier with a draft of 10.6 meters in December 2021 following the order by Jovo in August. The shipbuilder launched the vessel, classed by LR, in February this year and the vessel completed its sea trials in September. Jovo previously said that its fleet currently includes four LNG and four LPG carriers and this is the first newbuild LNG carrier in its fleet. source : www.lngprime.com

QATARENERGY SEALS 27-YEAR LNG SUPPLY DEAL WITH ENI

State-owned QatarEnergy and Italy's Eni signed a 27-year sale and purchase deal for the supply of liquefied natural gas (LNG) from Qatar to Italy. Qatar's energy minister and chief executive of QatarEnergy, Saad Sherida Al-Kaabi, and Claudio Descalzi, CEO of Eni, signed the SPA during a ceremony in Doha, according to a statement by QatarEnergy issued on Monday. Under the deal, Eni will receive up to 1 mtpa, or up to 1.5 billion cubic meters per year, from the joint venture between QatarEnergy and Eni that holds an interest in Qatar's North Field East (NFE) expansion project. Eni is a partner in the 32 mtpa NFE expansion project with a 3.125 percent share. The volumes will be supplied to the receiving terminal FSRU Italia, currently located in Piombino, Italy, with expected deliveries starting from 2026 with a duration of 27 years. Eni said in a separate statement the LNG supply contract will contribute to Italy's security of supply through the diversification of its supply sources. The Italian firm is already importing in Europe 2.9 bcm per year from Qatar since 2007 under a long-term supply agreement.

Third European LNG supply deal in two weeks , QatarEnergy and UK-based Shell recently signed two long-term LNG sale and purchase deals for the supply of up to 3.5 mtpa of LNG from Qatar to the Netherlands for a period of 27 years. Prior to that, QatarEnergy also signed two deals with TotalEnergies for up to 3.5 mtpa and a period of 27 years. These supplies are intended for the Fos Cavaou LNG receiving terminal in southern France. Both Shell and TotalEnergies are partners in the giant Qatari LNG expansion project. Together, NFE and NFS form the wider North Field expansion project to increase LNG production from the North Field, adding 48 mtpa to Qatar's export capacity and bringing it to 126 mtpa.

Commitment to European markets, Al-Kaabi said QatarEnergy's partnership with Eni "has borne fruitful results including LNG deliveries through the Fluxys LNG terminal in Belgium's Zeebrugge port and upstream exploration projects in various locations around the world." He said this agreement further builds on Eni's first entry in the upstream sector in Qatar through "our partnership in the historic North Field East expansion project." "Together, we will continue to demonstrate commitment to the European markets in general, and to the Italian market in particular. Since 2009, Qatari LNG has been arriving at the Adriatic LNG terminal in the northern Adriatic to meet more than 10 percent of Italy's natural gas requirements," Al-Kaabi said.

More LNG deals expected , QatarEnergy recently officially started building its North Field expansion project. Descalzi and the CEOs and senior executives of QatarEnergy's other partners in the expansion project attended the event. Besides Shell, TotalEnergies, and Eni, QatarEnergy's partners in the project are ConocoPhillips, ExxonMobil, Sinopec, and CNPC. Prior to these three deals, QatarEnergy signed huge LNG supply deals with China's CNPC and Sinopec. These deals are for 27 years and 4 mtpa of LNG. QatarEnergy also signed a 15-year deal to supply LNG to Bangladesh's state-owned Petrobangla, and it signed a 15-year deal with US energy firm ConocoPhillips to supply Germany with LNG. The firm is expected to announce additional LNG supply deals by the end of this year. source : www.lngprime.com

COOLCO SECURES FINANCING FOR LNG NEWBUILDINGS

Idan Ofer's Cool Co said China's Huaxia Financial Leasing has arranged to buy two LNG newbuilds and charter them back over a 10-year period. 174,000-m³ Kool Tiger and Kool Panther are scheduled for delivery H2 2024 from South Korea's Hyundai Samho Heavy Industries. New York-listed CoolCo said the sale and leasebacks are on a fixed rate per day basis for 10 years, with an implied interest rate just under 6% and a minimum loan-to-value of 80%. There is potential for additional capacity contingent upon the charter terms the company anticipates securing in advance of the vessels' deliveries. CoolCo said it has now "fully financed" the two LNG carrier newbuilds. The Huaxia deal comes four months after CoolCo said it exercised options to acquire the newbuildings from Eastern Pacific Shipping Ventures, a unit of Ofer's Eastern Pacific Shipping, for some US\$234M each. CoolCo chief financial officer John Boots said, "Having completed the financing of these two state-of-the-art, 2-stroke mega LNG carrier newbuilds, this materially strengthens CoolCo's future cash flow potential and strategic capabilities in a non-dilutive manner that clearly benefits our shareholders." "The combination of our robust financial position and a substantial backlog in charters provides us with considerable flexibility, both commercially and financially, enabling us to further grow the company. We believe the near- and long-term opportunities in the LNG transport market are substantial, supported by an increased emphasis on energy security and the dramatic expansion of global LNG production currently underway." source

: www.rivieramm.com

LNG INNOVATIONS AT GASTECH

At Gastech 2023, LNT Marine and Keppel FELS signed a framework agreement giving Keppel access to LNT A-BOX technology. This supports projects Keppel is currently working on, where the IMO type A tank system developed by LNT Marine can be retrofitted or integrated into newbuild vessels. The framework agreement recognises the competitiveness of LNT Marine's A-BOX containment by an established shipyard and elevates the status of the containment system to that of established systems. Since the 1970s, the market for LNG containment systems has been dominated by membrane technology. LNT Marine says its alternative containment system is ready to dominate what its architects call 'the membrane monopoly'. LNT Marine's LNT A-BOX uses independent self-supporting prismatic IMO type A tanks, made of aluminium. Benefits include flexibility similar to Moss spherical tanks in terms of filling levels, as there are no liquid motion (sloshing) issues, and at the same time, better volume utilisation than membrane tanks, according to the company's chief operating officer, Stein Foss.

"The LNT A-BOX system has performed very well during operations"

The self-supporting tank enables the use of low-density foam materials in the insulation, which with the design criteria applied for ultra-low LNG temperatures, provide "optimal insulation thickness and density for the lowest possible thermal conductivity and boil-off rate," he said. Mr Foss said prismatic IMO type A tanks have been used for decades in LPG shipping without problems from liquid motion, nor leakage issues, which he says proves their suitability for LNG with a lower density. "We have recently completed a thorough technical assessment and robustness analysis in close collaboration with ship design company

SDARI, and the classification society ABS. This includes detailed FE analysis and fatigue assessment, and confirms that our LNT A-BOX system is a proven, ready-for-market design,” he said.



A pre-fabricated tank ready to be lowered into the hold of Saga Dawn (source: LNT Marine)

“While we do not yet have a confirmed order for larger-sized LNG carriers, the first vessel equipped with our containment system – 45,000-m³ LNG Jia Xing, originally Saga Dawn – has been trading actively in southeast Asia since early 2020. The LNT A-BOX system has performed very well during operations, including cooling, loading, unloading, ship-to-ship transfer operations and also sailing with varying filling levels. **“We have identified improvements to the thermal insulation system and installation process that will reduce costs and time”**

Saga Dawn was built at China Merchants Heavy Industry’s Jiangsu yard, a facility new to LNG carrier construction, which confirms LNT’s target of lowering barriers for new yards entering LNG carrier construction. “We viewed the Saga Dawn project as a pioneering project – a prototype to learn from,” said Mr Foss “We have already identified improvements to the thermal insulation system and installation process that will reduce costs and time.” LNT Marine vice president of cryogenic insulation, Per Ivar Nikolaisen, agreed and said lessons learned will increase the speed of future installations, as will the straightforward design which enables installation by regular shipyards without specialised equipment. He calculated that these factors “could reduce overall ship production time versus membrane systems.”

JDP to develop LNG tank structure technology

Bureau Veritas (BV) and Hanwha Ocean have announced a joint development project (JDP) focused on improving the design process of independent LNG fuel tanks and expediting the development of solutions for the structural assessment of these systems. A typical application would be on ultra large container ships (ULCS) where the tanks are not attached directly to the



deck. The agreement was signed by Hanwha Ocean head of R&D, Joong-Kyu Kang, and Bureau Veritas country chief executive Korea of marine and offshore, Drago Pinteric, at Gastech 2023. The partnership stems from the issue that many vessels are equipped with independent tanks, which are utilised for both LNG and LPG transport and as a fuel source. These tanks differ from traditional designs as they are not rigidly connected to the hull structure, but instead rely on numerous dedicated supports. The design of these supports must take into account non-linear structural response during operations, including aspects such as loss of contact and sliding. Addressing these contact non-linearities is often a time-consuming process that is sensitive to convergence parameters. However, BV has recently pioneered a new methodology to assess these behaviours accurately. By validating the method through extensive simulations, it has been demonstrated that the proposed solution greatly reduces central processing unit time, while maintaining the same high levels of accuracy. This methodology has been successfully integrated into the BV hydro-structure interaction suite Homer, enabling a fully consistent structural analysis of vessels equipped with independent tanks. Commenting on the partnership, Mr Kang, said: “Through this JDP with BV, it is expected that structural analysis technology will be further advanced to improve the performance of independent tanks and develop differentiated products for the application of future projects.” Mr Gregg-Smith added: “We are pleased to co-operate with Hanwha Ocean on the structural assessment of independent LNG fuel tanks, which will support technology development for the future application of innovative solutions, while also ensuring the safety of shipping.” source : www.rivieramm.com

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