

LNG Shipping News

AN LNG JOURNAL TITLE ON LNG CARRIERS

25 July 2019

Japan to lose top LNG importer spot

Japan could lose its pole position as the world's top LNG importer to China as early as 2022.

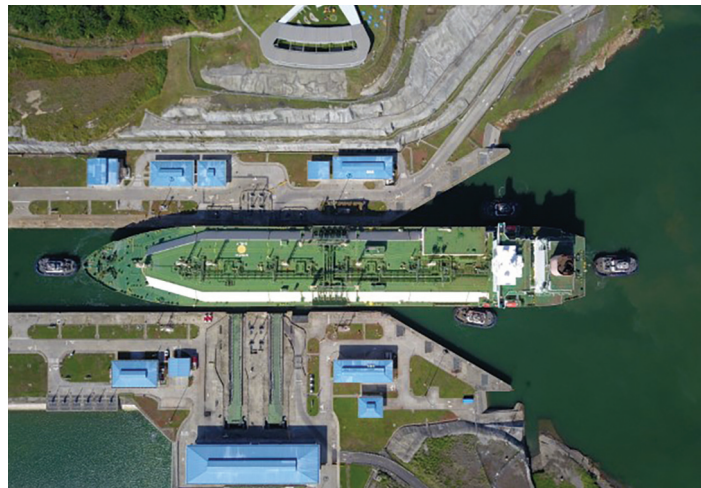
By then, LNG imports in Japan are expected to decline 12% to 72.8 mill tonnes per annum, compared to 2018, while China's import volume will rise 37.5% to 74.1 mill tonnes per annum, according to a new report published by Wood Mackenzie.

Despite losing its leadership position, Japanese buyers will continue to take a lead in contracting innovation, such as developing hybrid deals, coal indexation, joint procurement and carbon neutral cargoes.

As several long-term contracts wind down from the early 2020s and with gas and power market liberalisation underway, these innovations will provide buyers more leverage and opportunities in future contracting discussions.

Meanwhile, ensuring security of supply through diversity of sources will remain of primary concern. Japanese buyers should continue to lead the market in sourcing LNG from new supply regions, the report said.

"While LNG demand is declining, Japanese imports will remain above 70 mill tonnes per annum through much of the 2020s. It will remain the second largest LNG consumer in the world until at least 2040, with demand still



'Al Safiya' - Heading for China rather than Japan?

exceeding 60 mill tonnes. As such Japan still provides ample opportunities for LNG sellers, particularly as existing contracts expire," said senior analyst, Lucy Cullen. "The decline in Japanese imports will be driven by competition from coal, nuclear and renewables in the power sector and slow macroeconomic growth."

Coal to gas

Despite sustained low LNG spot prices, Japan's electricity market does not favour coal to gas switching on a wide scale. The country remains well-contracted in LNG to the early 2020s, as US and Australian supplies ramp-up.

As a result, the average cost of gas for Japanese utilities remains

well above spot prices and coal is still the cheapest form of electricity generation after nuclear and renewables on a short-run marginal cost basis.

Under Japan's 5th Strategic Energy Plan (2018), the government aims to decrease gas and coal generation (down to 27% and 26% shares, respectively) and offset this loss with greater low-carbon nuclear and renewable generation.

"The tide appears to be turning with increasing restrictions on financing and building coal. As such, we expect this policy target and such a robust share of coal in the generation mix will be increasingly difficult to sustain. This would improve the outlook for LNG," Cullen added. ■

Cyprus tenders for FSRU

Three joint venture companies have been selected by Cyprus in the first stage of a tender to provide an FSRU to import LNG at Vassiliko Bay.

According to Natural Gas Public Co of Cyprus, the three jvs were -

- * A consortium led by China Petroleum Pipeline Engineering.
- * Samsung C&T, Posco E&C, Mitsui OSK Lines (MOL) and Japanese utility, Osaka Gas.
- * GasLog, a division of Spanish utility Enagas and Italian gas infrastructure company SNAM.

Cyprus aims to have the FSRU operational by 2021 and has received a €101 mill grant from the European Union.

The Cypriot utility requested expressions of interest last month to supply the LNG, with a deadline of 6th September. ■

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Major response to Pakistan's giant cargo tender

Italian oil major Eni, PetroChina and two trading houses are locked in battle to supply LNG to Pakistan in one of the largest tenders yet seen, worth billions of dollars.

The 240 cargo 10-year tender, which is likely to be worth from \$5 bill to \$6 bill, according to Reuters calculations and estimates from other sources based on current market conditions, was issued last month and closed on 18th July.

Pakistan is expected to be a significant growth driver in global

LNG demand, with WoodMac estimating the country will need 25 mill tonnes a year, as domestic supplies dwindle and its economy grows.

The companies that offered to take the cargoes included Eni; the trading arm of Azeri state oil company SOCAR; PetroChina Interna-

tional Singapore, a unit of PetroChina Co Ltd and global trading house Trafigura, sources told Reuters.

Commercial offers are expected to be opened on 2nd August, which is when tender issuer, Pakistan LNG is likely to announce the prices.

Pakistan LNG issued the tender in early June to import 240 LNG cargoes of 140,000 cu m each for delivery over a 10-year period for the country's second LNG terminal.

All of the cargoes will be delivered to Pakistan GasPort Consortium Ltd's terminal, with the first delivery expected between September, 2019 and March, 2020.

The country's biggest supplier is currently Qatar, which in 2016, signed a deal for 3.75 mill tonnes of LNG per year for 15 years. Pakistan LNG also has a five-year import deal with commodity trader Gunvor and a 15-year agreement with Eni, Reuters said. ■



Pakistan has issued a huge tender for 240 cargoes

Cheniere takes Höegh LNG newbuilding FSRU

Höegh LNG Holdings has signed a short term LNGC timecharter with Cheniere Marketing International for its newbuilding FSRU 'Höegh Galleon'.

The timecharter commences in September, 2019 after her delivery from Samsung Heavy Industries. She will be Höegh LNG's 10th FSRU.

The timecharter period ensures that the FSRU will be available to serve the AIE project in Port Kembla, Australia, where Höegh LNG will be the unit's provider on a back-to-back basis, the company said.

AIE recently announced a contract to supply gas to its foundation customer from 1st

January, 2021.

Under the contract terms, 'Höegh Galleon' will earn an undisclosed fixed daily charter rate.

Sveinung Støhle, Höegh LNG President and CEO, said: "We are very pleased to further develop our relationship with Cheniere, the US' largest LNG exporter. This charter party will cover the period from delivery of 'Höegh Galleon' until its planned start-up in Port Kembla.

"Combined with a finalised AIE

contract and the project's FID, 'Höegh Galleon' will have long-term contract coverage in line with HLNG's stated strategy. Finally, from commencement of the Cheniere contract in September, Höegh LNG's fleet will be fully employed," he said.

Elsewhere, Indian utility GAIL said it had chartered an MOL newbuilding for three years from 2021.

The company also intends to charter in more tonnage, it said in a results presentation. ■

Elba LNG at an advanced stage

Although behind schedule, Elba Liquefaction Company (ELC) is in advanced stages of commissioning and start up.

This includes LNG production on the first of 10 liquefaction units of the \$2 bill Elba liquefaction project, operator Kinder Morgan (KMI) said in its second quarter 2019 presentation.

Work continued in parallel on the remaining nine units. ELC will begin to receive about 70% of the total revenue when the first unit goes into service, KMI said.

The US authorities approved project at the Southern LNG Co facility at Elba Island near Savannah, Georgia, will have a total liquefaction capacity of around 2.5 mill tonnes per year of LNG. The project is supported by a 20-year contract with Shell.

ELC, a KMI joint venture with EIG Global Energy Partners (49%), will own the liquefaction units and other ancillary equipment. Other facilities attached to the project are 100% owned by KMI. ■



The Elba LNG project moves a step closer

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Total to purchase Driftwood gas

Tellurian has entered into definitive agreements with Total Delaware, Inc (Total) and Total Gas & Power North America, Inc (Total Gas & Power) for the latter to purchase 1 mill tonnes per annum of LNG from the Driftwood LNG terminal.

In addition, Total will invest \$500 mill in Driftwood Holdings.

Tellurian and Total Gas & Power also entered into a definitive sales and purchase (SPA) agreement for an additional 1.5 mill tonnes per year of LNG from Tellurian's LNG offtake volumes from Driftwood.

This SPA calls for the purchase of LNG on a 'free on board' basis at a price based on Platts Japan Korea Marker.

These agreements are consistent with the terms contemplated by the Heads of Agreement announced on 3rd April, 2019, and are subject to certain closing conditions, including the final investment decision (FID) to build Driftwood, Tellurian said.

Tellurian President and CEO,

Meg Gentle, said, "The agreements we have executed with Total confirm the business model for the Driftwood project, establishing it as an LNG joint venture partnership with an implied value of \$13.8 bill.

"The Tellurian team thanks Total for their leadership and we look forward to beginning the largest privately funded US infrastructure project. We intend to finalise the agreements with the remaining partners and make FID in 2019.

"At full capacity, Driftwood will be capable of exporting approximately 4 bill cu ft per day of natural gas, providing solutions for the acute US oversupply and delivering cleaner air to the world," she said.

As announced in April, Tellurian and Total executed a common stock purchase agreement by which Total will purchase shares of Tellurian common stock for around \$200 mill, subject to certain closing conditions, including the FID to construct Driftwood.

Thus, Total's total investment in the Tellurian portfolio will be about \$907 mill at FID.

The Driftwood LNG project is a proposed 27.6 mill tonnes per annum liquefaction export facility to be located near Lake Charles, Louisiana on the US Gulf Coast. The terminal and associated pipeline have received all the necessary permits and licenses to begin construction, the company claimed. ■

NOVATEK reports large increase in gas sales

Russian oil and gas producer, PAO NOVATEK has announced that preliminary second quarter 2019 natural gas sales volumes, including volumes of LNG sold, totalled 18.74 bill cu m.

This represents an increase of 23.7%, compared with the corresponding period in 2018.

Natural gas volumes sold in the Russian Federation in 2Q19 were 15.11 bill cu m, whereas volumes of LNG sold on international markets amounted to 3.63 bill cu m.

As at 30th June, 2019, NOVATEK had 1.4 bill cu m of natural gas, including LNG, and 629,000 tonnes of stable gas condensate and petroleum products in storage or transit and recognised as an inventory.

In addition, NOVATEK has announced the closing of the participation sale in the Arctic LNG 2 project to wholly owned subsidiary of China National Petroleum Corp (CNPC), wholly owned subsidiary of CNOOC, and a consortium involving Mitsui & Co and Japan Oil, Gas and Metals National Corp (Japan Arctic LNG).

"We now have formed the structure of the project's participants by successfully closing the sale of interests in Arctic LNG 2," said Leonid Mikhelson, NOVATEK's Chairman of the Management Board. "The target level of NOVATEK's participation has been reached, allowing us to make the final investment decision and optimally use the company's cash flow to finance our new projects." ■

Another Arc7 to use the NSR on delivery voyage

On 18th July, Mitsui OSK Lines, Ltd. (MOL) held a naming ceremony for its third and final icebreaking Arc7 LNGC.

She was jointly ordered by MOL and China COSCO Shipping Corp Limited (China COSCO Shipping).

The ceremony was held at Dae-woo Shipbuilding & Marine Engineering (DSME) and the newbuilding was named 'Nikolay Urvantsev'.

She is scheduled to enter service for the Yamal LNG project following her delivery this month.

Once delivered, she will transit the Northern Sea Route (NSR) without icebreaker support, bound for Sabetta.

MOL said that it had made the decision to participate in the Yamal LNG project in July, 2014, and the construction of the vessels commenced in May, 2016.

To manage design and construction plan approvals, MOL worked closely with DSME, Yamal LNG personnel, and other operators of icebreaking LNGCs on the project, as well as consultants.

In addition to the icebreaking LNGCs, construction of the four conventional LNGCs, destined for the Yamal LNG project announced in June, 2017, is progressing as planned, MOL said.

All 15 Arc7s are now in the water, as the final two are reported to be undergoing sea trials. ■



'Nikolay Urvantsev' will soon be transiting the NSR towards Sabetta

Affinity in first Baltic Exchange LNG freight swap

Affinity (Shipping) has organised the first LNG freight swap settled against the Baltic Exchange LNG spot assessments.

The trades, involving Total Gas & Power and Glencore, were arranged over-the-counter by Affinity Financial Products and executed bi-laterally by the counterparties.

"With liquidity increasing in the LNG market in recent years, freight has come under the spotlight as participants look to manage their exposure to vessel spot rates," said Benjamin Gibson, Affinity's Head of LNG Derivatives. "Using the Baltic Exchange's rate assessments we are able to help clients benchmark their freight exposure and develop a forward market for hedging price risk."

Last winter tight vessel availability pushed charter rates from

an average \$50,000 per day during the first half of the year to above \$200,000 per day during November, 2018. By March, 2019 the Baltic BLNG1 assessment had fallen to almost \$20,000 per day.

As LNG traders seek to build up volumes, their exposure to this volatility in freight rates increases.

Methodology

The Baltic Exchange's LNG rate assessment methodology uses submissions from independent shipbrokers to mark LNGC TCE rates on certain, key trade lanes. This benchmark includes not only the headline rates for chartering the vessels, but also the highly important ballast bonus and/or posi-

tion fees paid by charterers, depending on market conditions.

Baltic Exchange Chief Executive, Mark Jackson, said: "The Baltic has over 30 years of experience of benchmarking freight markets and our LNG assessments are the latest in our suite of shipping market data. We're delighted that this product has been adopted by the market, which has recognised the value and quality of our index production process.

"We look forward to continue working with brokers and users in this developing market and anticipate that the next two Baltic LNG routes (USG/East Coast UK and USG/Far East) will go live later in the year," he said.

This first trade represents an

important milestone in the development of an LNG forward freight market. With the Baltic Exchange set to release further LNG spot route assessments Affinity forecast more appetite for bilateral trades.

"Initial trades are all about testing the settlement mechanism. Now is the time to try things and see how they work. We have lots of interest in the Baltic's forthcoming Atlantic routes and a weighted average of routes to give a global LNG freight benchmark," added Gibson. "The strong growth in financial trading of JKM and the spreads to other natural gas hubs will underpin the physical demand for hedging freight rates as understanding of the products and market develops," he explained. ■

Qatargas delivers milestone LNG cargo to Japan

Qatargas has delivered its 3,000th LNG cargo to Japan.

The cargo was shipped on board 'Al Jasra', a conventional LNGC with a capacity of 135,000 cu m, and was delivered to JERA's Kawagoe LNG receiving terminal.

Qatar's first shipment was also delivered to Kawagoe on 10th January, 1997.

HE Saad Sherida Al-Kaabi, Qatar Minister of State for Energy

Affairs, President & CEO of Qatar Petroleum, and Chairman of Qatargas Board of Directors, said:

"We are delighted to celebrate the 3,000th LNG delivery to Japan. This significant milestone comes over two decades following the first delivery to our foundation customer in Japan. Qatar, as the largest LNG producer in the world,

is committed to delivering LNG safely and reliably to our customers across the globe."

He added: "Qatargas' commitment to serving Japan's energy needs has never been stronger. We are focused on boosting future co-operation with Japan, and building even stronger relations with our Japanese customers and friends."

Khalid bin Khalifa Al Thani, Qatargas CEO, said: "Utilising our flexible and reliable operations, we celebrate the uninterrupted supply of this 3,000th LNG cargo to Japan, which is a major milestone reflecting the relationship between Qatargas and our esteemed Japanese customers. This delivery demonstrates Qatargas' commitment to continue providing Japan, and all of our customers around the globe, with a safe and reliable source of clean energy."

Qatargas has term contracts to supply LNG with many Japanese buyers, including JERA, Tohoku

Electric, Kansai Electric, Chugoku Electric, Tokyo Gas, Osaka Gas, Toho Gas and Shizuoka Gas, the company said.

Apart from the term contracts, Qatargas also delivers a significant amount of Japan's spot LNG requirements.

In another move, Qatargas has delivered the first LNG cargo shipped on a Q-Flex to Greece's Revithoussa LNG Terminal.

This is for the first time that a Q-Flex has called at the terminal since it was expanded late last year. The cargo, loaded at Ras Laffan on 3rd July, 2019, was shipped on the Q-Flex, 'Al Gharrafa', which arrived on 20th July, 2019.

This Q-Flex cargo was part of another multi-port delivery executed by Qatargas. It is being undertaken in co-operation with the European utility ENGIE, which will see the second cargo delivered to the Cartagena LNG terminal in Spain later this month. ■



The first Q-Flex recently called at Greece's Revithoussa Terminal

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Freeport LNG's first train to receive commissioning gas

Freeport LNG has been given the go-ahead to begin gas flows into its first liquefaction train for commissioning purposes.

The terminal, located south of Houston, will be the sixth major LNG export facility to begin operations in the US when it starts production, after Kinder Morgan said on 17th July that liquefaction was underway at its Elba facility in Georgia (see page 2).

There were gas flows observed

to all six facilities on 19th July, totaling about 6.5 bill cu ft per day, according to S&P Global Platts Analytics data.

In a note to Freeport LNG, the US Federal Energy Regulatory Commission (FERC) said the operator can now introduce hazardous fluids for the commissioning of Train 1

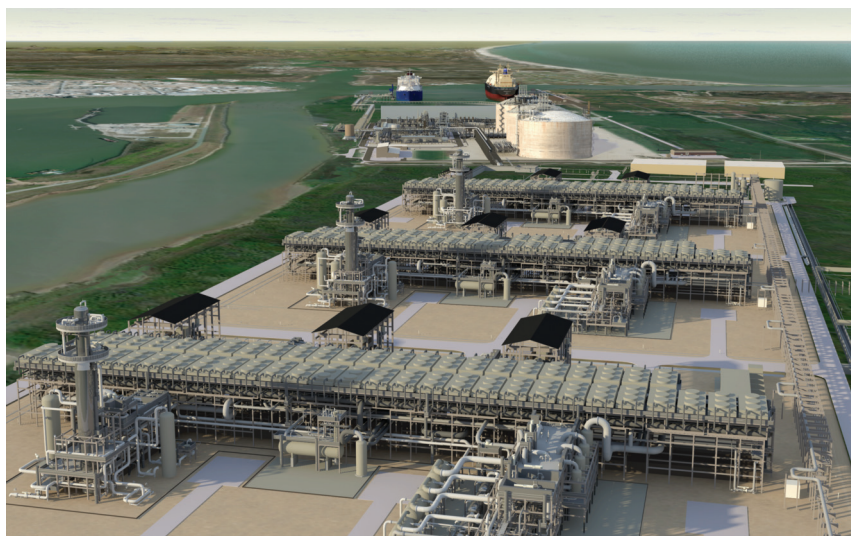
and associated utility systems.

However, it must apply for and receive separate permission to place the unit into service.

"In order to demonstrate the progress in testing needed to show that the facilities can safely and reliably operate at or near the design production rate specified

in the commission order, Freeport LNG shall file weekly reports on the ongoing commissioning activities once LNG is produced from Train 1 until the commission authorises commencement of service," FERC said.

Earlier this month, Freeport LNG had said that the first commissioning cargo would be ready to load in August.



Freeport LNG's Train 1 is to receive commissioning gas

Calcasieu Pass funded

Venture Global LNG's \$5.8 bill Calcasieu Pass LNG construction financing project has received over \$10 bill in binding commitments from initial co-ordinating lead arrangers.

This transaction is nearly two times oversubscribed, prior to retail syndication, the company said

The proceeds, along with the equity investment from Stonepeak Infrastructure Partners, will fund the construction and commissioning of the Calcasieu Pass facility and the associated TransCameron pipeline.

The lender group consists of leading Asian, European and North American project finance banks, including Banco Santander, Bank of America, Goldman Sachs Bank USA, Industrial & Commercial Bank of China, ING Capital, JPMorgan Chase Bank, Mizuho Bank, Morgan Stanley Senior Funding, Natixis, Nomura Securities International,

Royal Bank of Canada, Sumitomo Mitsui Banking Corp, and The Bank of Nova Scotia.

Venture Global LNG Co-CEOs Mike Sabel and Bob Pender jointly stated, "The incredible market response to our Calcasieu Pass debt facility is the culmination of many years of work by our team. We are incredibly proud that the world's leading project finance institutions have responded with such a validation of the quality of our structure and partners with outstanding terms and a significant over-subscription. The company has now secured more than \$8.6 bill of capital and is continuing full construction and fabrication activity at Calcasieu Pass."

The 10 mill tonnes per annum

Calcasieu Pass export terminal will employ a comprehensive process solution from Baker Hughes, a GE company (BHGE) that utilizes mid-scale, modular, factory-fabricated liquefaction trains.

In addition, Kiewit is designing, engineering, constructing, commissioning, testing and guaranteeing the facility.

Calcasieu Pass has received all necessary permits, including FERC authorisation and non-FTA export authorisation from the US Department of Energy.

Venture Global LNG is also developing the 20 mill tonnes per annum Plaquemines LNG project and the same capacity Delta LNG project, both located in Plaquemines Parish, Louisiana.

AG&P receives investment boost

AGP International Holdings Pte Ltd (AG&P) has received a major equity investment from two Japanese institutions.

Osaka Gas Co Ltd, through its affiliate OsakaGas Singapore Pte Ltd and the Japan Bank for International Cooperation (JBIC) have taken a minority stake in AG&P.

This capital will be used to execute AG&P's multiple LNG initiatives worldwide, including the development and roll-out of small-and medium-scale LNG import terminals, such as AG&P's pending terminals in Karaikal, India and elsewhere.

Other projects include the development of LNG bunkering vessels, FSRUs and LNG, dual-fuel applications for ships and advanced modularisation and field construction services for global energy and commodity markets in the US, Australia, the South Pacific and South-east Asia, plus the rapidly accelerating domestic infrastructure in the Philippines, where AG&P owns and operates two major yards, the company said.

Dr. Jose Leviste Jr, AG&P Chairman, said; "AG&P and Gas Entec, working together, bring innovative, in-house engineering, project management, manufacturing, licensed LNG tank and handling system outfitting, construction, project development, customer marketing and operations management for LNG-related projects and for our modularisation, site-work and other customers.

"We look forward to changing how the LNG industry works," he added.

ABS and MOL to co-operate on newbuilding gas carriers

ABS and Mitsui OSK Lines (MOL) have signed a Memorandum of Understanding (MOU) to collaborate on up to 14 new gas carriers.

This agreement covers seven new-build Very Large Ethane Carriers (VLEC) and up to seven newbuilding LNGCs designed to carry gas from the US to China and other markets.

"ABS is a world leader in gas and the classification of gas carriers, with a track record of supporting some of the most innovative and technically demanding pro-

jects in the world," said Tony Nas-sif, ABS Executive Vice President and COO. "It is outstanding to have that expertise recognised by an innovator such as MOL. ABS is proud to be able to use our extensive experience to support these projects and advance the safe handling, storage and transportation of gas."

ABS will provide plan reviews,

surveys, inspections and other classification services for the vessels, plus their machinery and equipment, as well as assistance with managing the requirements for foreign flag carriers calling at US terminals.

"Joining our accumulated experience and knowledge as one of the world's leading LNG carrier owners

and management companies and the largest VLEC operator in the world, with ABS' extensive experience, demonstrates that MOL is committed to offering safe, high-quality and efficient gas transport service to customers," said Tatsuro Watanabe, MOL General Manager, Energy Business Strategy Division, Energy Transport Business Unit. ■

RS updates liquefied gases carriage rules

Russian Maritime Register of Shipping (RS) has published a new edition of the 'Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk (2019)' on its website.

Compared to the 2016 edition, amendments took into account new international requirements, together with feedback from the experience accumulated during technical supervision of the design and construction of LNGCs at South Korean shipyards, and RS' co-operation with LNG containment systems developers.

In some sections, vague and unclear wordings allowing ambiguous interpretation, were deleted. In addition, Part IV - Cargo Containment - was completely amended in the new edition.

For the convenience of users, this is fully consistent with the

similar section of the IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code), RS said.

The requirements for the application of calculation methods were added while determining the loads on the walls of the membrane cargo tanks during sloshing. The provisions of IACS UIs have also been included.

Updating of Part IX - Materials and Welding - was also undertaken, which covered the advanced requirements for the materials used for the manufacture of gas carrier hull structures and LNG containment and processing systems members. ■

Toyo to build Indian regas plant

Toyo Engineering India Pvt Ltd, a wholly owned subsidiary of Toyo Engineering Corp, has been awarded a contract to build a regasification plant for HPCL Shapoorji Energy Pvt Ltd (HSEPL).

To be located at Chhara in Gujarat State on the west coast of India, the new plant will have a send out capacity of 5 mill tonnes.

Toyo India will execute EPC work on a turnkey basis - from engineering to construction and commissioning. The regasification plant is scheduled to be completed at the beginning of 2022.

HSEPL is a joint venture, between HPCL (Hindustan Petroleum Corp), which is one of India's major Government-owned refining & oil marketing companies and SP Ports Pvt Ltd - a Shapoorji Pallonji Group company.

The company is developing the 5 mill tonnes per annum LNG receiving, storage & regasification terminal, which can be expanded to 10 mill tonnes.

Earlier, Toyo-India & Toyo-Japan executed Petronet LNG's Dahej Terminal Phase I (green-field), Petronet LNG's Phase II & III expansion and GSPC LNG green-field Mundra terminal.

In a rapidly developing country like India with an ever growing demand for LNG, Toyo-India will develop further orders, as a top player in the construction of LNG regasification facilities, the company said. ■

NEWS NUDGE

GTT wins more orders

GTT has received two new orders from the Hyundai group to design the tanks of two LNGCs.

They will have a capacity of 180,000 cu m and 174,000 cu m each, respectively and are being built for undisclosed owners.

The two LNGCs will be built at Hyundai Heavy Industries (HHI) and Hyundai Samho Heavy Industries (HSHI).

GTT's Mark III Flex membrane containment system was chosen to equip the tanks of the vessels,

the deliveries of which are scheduled for between the fourth quarter of 2021 and the first quarter of 2022.

SHI to build LNG technology R&D facility

Samsung Heavy Industries (SHI) is to build an R&D centre.

The shipbuilder said it had started constructing an LNG system test facility at its Geoje shipyard. It plans to complete the centre by December, 2020.

Once complete, it will test and verify the company's various LNG-related technologies, including liquefaction of gases and

cryogenic storage systems, used in ships and offshore plants.

Trelleborg snaps up Signum

Through its Trelleborg Industrial Solutions business division, Sweden's Trelleborg has finalised the acquisition of the engineering group, Signum Technology.

Signum delivers safety solutions for flow control for the oil, gas and petrochemicals industries, such as marine breakaway couplings and LNG transfer systems.

The acquisition complements and extends Trelleborg's product portfolio and strengthens the

company as a system provider, primarily to the fast-growing LNG transfer market segment, it said.

Signum is headquartered and manufactures in the UK, and has service centres globally. Sales totaled around SEK410 mill in 2018.

New orders

Brokers reported that NYK had exercised another option for a 174,000 cu m LNGC at Hyundai Samho.

In addition, SK Shipping was said to have ordered an 180,000 cu m unit at HHI for \$190 mill.

She is due for delivery in 2021. ■

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WORLD LNG CARRIER ORDERBOOK

Yard	Containment System	Capacity	Propulsion	Delivery Date	Ordered	Primary Owner
JMU	SPB	165000	TFDE	Apr-19	Feb-14	MOL
JMU	SPB	165000	TFDE	Jul-19	Feb-14	MOL
JMU	SPB	165000	TFDE	Apr-19	Feb-14	NYK
DSME	GT NO 96	173400	MEGI	May-19	Jun-14	Maran Gas Maritime
DSME	GT NO 96	172000	TFDE - Azipod	Jul-19	Jul-14	Teekay LNG
DSME	GT NO 96	172000	TFDE - Azipod	Aug-19	Jul-14	Teekay LNG
DSME	GT NO 96	172000	TFDE - Azipod	Oct-19	Jul-14	Teekay LNG
DSME	GT NO 96	172000	TFDE - Azipod	Nov-19	Jul-14	Teekay LNG
DSME	GT NO 96	172410	TFDE - Azipod	Sep-19	Jul-14	MOL
Kawasaki	Moss	155000	TFDE	Dec-19	Sep-14	MOL
DSME	GT NO 96	173400	MEGI	Apr-19	Nov-14	BP
Mitsubishi H.I.	Moss	177000	STaGE	Sep-19	Jan-15	MOL
DSME	GT NO 96	173400	MEGI	Sept-19	Sep-15	BWGas
Kawasaki	Moss	177000	STRH	Jul-19	Sep-15	MOL
Mitsubishi H.I.	Moss	165000	STaGE	May-19	Nov-15	Mitsubishi
Mitsubishi H.I.	Moss	180000	STaGE	Jun-19	Nov-15	NYK
Mitsubishi H.I.	Moss	180000	STaGE	Feb-19	Nov-15	NYK
Hyundai Heavy	GTT Mark III Flex	180000	XDF	Apr-19	May-16	SK Shipping
Hyundai Heavy	GTT Mark III Flex	180000	XDF	May-19	May-16	SK Shipping
DSME	GT NO 96	173400	MEGI	Oct-19	Jun-16	Maran Gas Maritime
DSME	GT NO 96	173400	MEGI	Nov-19	Jun-16	Maran Gas Maritime
DSME	GT NO 96	173400	MEGI	Apr-20	Dec-16	Maran Gas Maritime
Hyundai Heavy	GTT Mark III Flex	180000	MEGI	May-19	Mar-17	Knutsen
DSME	GT NO 96	173400	MEGI	Jun-19	Mar-17	Flex LNG
DSME	GT NO 96	173400	MEGI	Aug-19	Mar-17	Flex LNG
Hyundai Heavy	GTT Mark III Flex	180000	MEGI	Jun-19	May-17	Knutsen
Hudong-Zhonghua	GT NO 96	174000	MEGI	Dec-19	Jul-17	MOL
Hudong-Zhonghua	GT NO 96	174000	MEGI	Mar-20	Jul-17	MOL
Hudong-Zhonghua	GT NO 96	174000	MEGI	Jul-20	Jul-17	MOL
Hudong-Zhonghua	GT NO 96	174000	MEGI	Oct-20	Jul-17	MOL
Samsung	GTT Mark III Flex	180000	XDF	Jun-19	Dec-17	GasLog
DSME	GT NO 96	173400	MEGI	May-20	Dec-17	Maran Gas Maritime
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-20	Jan-18	NYK
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jan-20	Jan-18	Cardiff Marine
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-20	Jan-18	Sovcomflot
DSME	GT NO 96	173400	MEGI	Dec-19	Feb-18	BWGas
DSME	GT NO 96	173400	MEGI	Jun-20	Feb-18	BWGas
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-20	Feb-18	Cardiff Marine
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Apr-20	Feb-18	Cardiff Marine
DSME	GT NO 96	173400	MEGI	Aug-20	Feb-18	John Fredriksen
DSME	GT NO 96	173400	MEGI	Sep-20	Feb-18	John Fredriksen
Hyundai Heavy	GTT Mark III Flex	174000	XDF	May-20	Mar-18	Flex LNG
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jul-20	Mar-18	Flex LNG
Samsung	GTT Mark III Flex	180000	XDF	Apr-20	Mar-18	GasLog

DFDE = dual fuel diesel engines, STRH = steam turbine reheat / ultra steam turbine, MEGI = marine electric gas injection, DRL = slow speed diesel, FSRU = vessel with regas capacity, FLNG = floating LNG production unit
Data last updated = 4th April 2019

Yard	Containment System	Capacity	Propulsion	Delivery Date	Ordered	Primary Owner
Samsung	GTT Mark III Flex	174000	XDF	Mar-20	Mar-18	Cardiff Marine
DSME	GT NO 96	173400	MEGI	Dec-20	Mar-18	Minerva Marine
DSME	GT NO 96	173400	MEGI	Jan-21	Mar-18	Minerva Marine
Hyundai Heavy	GTT Mark III Flex	180000	MEGI	Jun-20	Mar-18	Knutsen
DSME	GT NO 96	173400	MEGI	Aug-20	Mar-18	Alpha Gas
DSME	GT NO 96	173400	MEGI	Dec-20	Mar-18	Alpha Gas
Samsung	GTT Mark III Flex	180000	XDF	Sep-20	May-18	GasLog
DSME	GT NO 96	173400	MEGI	Oct-20	Jun-18	Maran Gas Maritime
DSME	GT NO 96	173400	TFDE	Apr-21	Jun-18	Maran Gas Maritime
DSME	GT NO 96	173400	MEGI	Apr-21	Jun-18	Alpha Gas
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Sep-20	Jun-18	Thenamaris
Hyundai Heavy	GTT Mark III Flex	174000		Feb-21	Jun-18	Flex LNG
Hyundai Heavy	GTT Mark III Flex	174000		May-21	Jun-18	Flex LNG
Hyundai Heavy	GTT Mark III Flex	174000		Oct-20	Jul-18	Capital Gas
Hyundai Heavy	GTT Mark III Flex	174000		Nov-20	Jul-18	Capital Gas
Hyundai Heavy	GTT Mark III Flex	174000		Mar-21	Jul-18	Capital Gas
Hyundai Heavy	GTT Mark III Flex	174000		Jun-21	Jul-18	Capital Gas
DSME	GT NO 96	173400	MEGI	Nov-20	Jul-18	John Fredriksen
Samsung	GTT Mark III Flex	180000	XDF	Dec-20	Aug-18	Celsius Shipping
Samsung	GTT Mark III Flex	180000	XDF	Mar-21	Aug-18	Celsius Shipping
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Sep-20	Aug-18	Cardiff Marine
Samsung	GTT Mark III Flex	174000	XDF	Oct-20	Aug-18	GasLog
Samsung	GTT Mark III Flex	174000	XDF	Dec-20	Aug-18	GasLog
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-21	Sep-18	Cardiff Marine
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-21	Sep-18	Thenamaris
Samsung	GTT Mark III Flex	174000	XDF	Mar-21	Sep-18	NYK
Samsung	GTT Mark III Flex	174000	XDF	Jan-21	Oct-18	Minerva Marine
Samsung	GTT Mark III Flex	174000	XDF	Sep-21	Oct-18	Minerva Marine
Samsung	GTT Mark III Flex	174000	XDF	Feb-21	Nov-18	Cardiff Marine
Samsung	GTT Mark III Flex	174000	XDF	Jan-21	Nov-18	Cardiff Marine
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-21	Nov-18	Cardiff Marine
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Apr-21	Nov-18	Cardiff Marine
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-21	Nov-18	Latsco Shipping
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-21	Nov-18	Latsco Shipping
Samsung	GTT Mark III Flex	174000	XDF	Aug-21	Dec-18	NYK
Samsung	GTT Mark III Flex	174000	XDF	Nov-21	Dec-18	NYK
DSME	GT NO 96	174000	MEGI	Feb-21	Dec-18	BWGas
DSME	GT NO 96	174000	MEGI	Jun-21	Dec-18	BWGas
DSME	GT NO 96	173400	MEGI	Jun-21	Dec-18	Maran Gas Maritime
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Nov-20	Dec-18	NYK
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Mar-21	Dec-18	NYK
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jun-21	Dec-18	NYK
DSME	GT NO 96	180000	MEGI	Dec-20	Dec-18	MOL
DSME	GT NO 96	173400	MEGI	Jun-21	Dec-18	MOL
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Sep-20	Dec-18	Sovcomflot

DFDE = dual fuel diesel engines, STRH = steam turbine reheat / ultra steam turbine, MEGI = marine electric gas injection, DRL = slow speed diesel, FSRU = vessel with regas capacity, FLNG = floating LNG production unit
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Yard	Containment System	Capacity	Propulsion	Delivery Date	Ordered	Primary Owner
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Feb-21	Dec-18	Sovcomflot
Samsung	GTT Mark III Flex	180000	XDF	Jun-21	Dec-18	GasLog
Samsung	GTT Mark III Flex	180000	XDF	Aug-21	Dec-18	GasLog
Samsung	GTT Mark III Flex	174000	XDF	Mar-21	Dec-18	Cardiff Marine
DSME	GT NO 96	174000	MEGI	Jun-21	Dec-18	Alpha Gas
Samsung	GTT Mark III Flex	174000	XDF	Mar-21	Dec-18	Navigare
Samsung	GTT Mark III Flex	180000	XDF	Jun-21	Feb-19	Celsius Shipping
Samsung	GTT Mark III Flex	180000	XDF	Sep-21	Feb-19	Celsius Shipping
Hudong-Zhonghua	GT NO 96	178000	XDF	Sep-21	Feb-19	CSSC
Hudong-Zhonghua	GT NO 96	178000	XDF	Feb-22	Feb-19	CSSC
DSME	GTT Mark III Flex	174000	MEGI	May-21		Nakilat
Samsung		174000		Sep-22		Sinokor
Samsung		174000		Sep-22		Sinokor
Samsung		174000		Sep-22		Sinokor
Samsung		174000		Sep-22		Sinokor
DSME	GTT Mark III Flex	173400	XDF	Aug-21		Nakilat
DSME	GTT Mark III Flex	173400	XDF	Oct-21		Nakilat
Hyundai Heavy	GTT Mark III Flex	174000	XDF	Jun-21		Capital Gas
Samsung		174000		Mar-22		Nisshin Shipping

DFDE = dual fuel diesel engines, STRH = steam turbine reheat / ultra steam turbine, MEGI = marine electric gas injection, DRL = slow speed diesel, FSRU = vessel with regas capacity, FLNG = floating LNG production unit
Data last updated = 4th April 2019



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WORLD SMALL SCALE LNG FLEET*

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
1974	Seagas	187	LNG	Sweden	Yes	AGA
1988	Kayoh Maru	1,517	LNG	Japan	Yes	Daiichi
1993	Aman Bintulu	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1996	Surya Aki	19,475	LNG	Indonesia - Japan	Yes	MCGC
1997	Aman Sendai	18,928	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
1998	Aman Hakata	18,800	LNG	Malaysia - Japan	Yes	Perbadanan/NYK
2000	Triputra	23,096	LNG	Indonesia - Japan	Yes	MCGC
2003	Pioneer Knutsen	1,100	LNG	Norway	Yes	Knutsen
2003	Shinju Maru No.1	2,540	LNG	Japan	Yes	Shinwa
2005	North Pioneer	2,500	LNG	Japan	Yes	Japan Liquid Gas
2007	Sun Arrows	19,531	LNG	Malaysia - Russia - Japan	Yes	Mitsui
2008	Kakurei Maru	2,536	LNG	Japan	Yes	Hogaki Zosen
2008	Shinju Maru No.2	2,540	LNG	Japan	Yes	Shinwa
2009	Coral Methane	7,551	LNG/LPG/Ethylene	Northwest Europe/Baltics	Yes, sometimes	Anthony Veder
2010	Norgas Creation	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2010	Norgas Innovation	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Akebono Maru	3,556	LNG	Japan	Yes	Chuo Kaiun
2011	Norgas Conception	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Norgas Invention	10,000	LNG/LPG/Ethylene	Worldwide	No	Norgas Carriers
2011	Vision Spirit	12,000	LNG/LPG/Ethylene	Worldwide	No	Teekay
2011	Unikum Spirit	12,000	LNG/LPG/Ethylene	Worldwide	No	Teekay
2012	Coral Energy	15,600	LNG	Northwest Europe/Baltics	Yes	Anthony Veder
2013	JX Energy TBN	2,500	LNG	Japan	Yes	JX Energy
2013	Kakuyu Maru	2,500	LNG	Japan	Yes	Tsurumi Sunmarine
2013	Coral Anthelia	6,500	LNG/Ethylene			Anthony Veder
2014	LNG-Oil combi**	2,000	LNG	Germany	Yes	Veka
2014	Short Sea LNG Tanker **	4,000	LNG	Germany	Yes	Veka
2015	LNG Inland bunker**	800	LNG	Germany	Yes	Veka
2015	LNG bunker barge 1†	2,250	LNG	China	Yes	Anhui Huaqiang Natural Gas
2015	LNG bunker barge 2†	2,250	LNG	China	Yes	Anhui Huaqiang Natural Gas
2015	LNG bunker barge 3†	2,250	LNG	China	Yes	Anhui Huaqiang Natural Gas
2015	LNG Barge TBN	3,000	LNG	US Coast	Yes	LNG America
2015	10 small carriers TBN**	5,000	LNG			Bimantara Group
2015	Jahre TBN**	6,200	LNG	Norway	Yes	Donsotank/Jahre Marine
2015	Norgas TBN**	17,000	LNG/LPG/Ethylene	Worldwide		Norgas Carriers
2015	Norgas TBN**	17,000	LNG/LPG/Ethylene	Worldwide		Norgas Carriers
2015	JS Ineos Ingenuity	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	JS Ineos Insight	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	JS Ineos Intrepid	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2015	TBN 1	27,500	LNG	China?		Danyang?
2015	TBN 2	27,500	LNG	China?		Danyang?
2015	TBN 3	27,500	LNG	China?		Danyang?
2015	PetroChina TBN	30,000	LNG	China		PetroChina
2016	Clean Jacksonville	2,200	LNG	US Coast	Yes	CME
2016	LNG Prime	2,250	LNG	Northwest Europe	Yes	Veka Deen LNG
2016	JS Ineos Indepence	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Innvation	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	JS Ineos Inspiration	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2016	Hai Yang Shi You 301	30,000	LNG	Bali FSU	Yes	CETS (CNOOC)
2016	Navigator Aurora	35,000	Ethane/Ethylene	Markus Hood - Stenungsund	Ethane, for Borealis	Navigator
2016	Gaschem Beluga	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services
2016	Gaschem Orca	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services

For more information please visit <http://small-lng.com>

*Includes multi-gas, ethylene and LNG bunker ships with 40,000 cubic metres LNG cargo capacity or less

TBN = To Be Nominated indicates ships are still at construction/planning stage

** = project shelved † =Data to be verified Data last updated = 4th March 2019

Built	Name	CBM	Cargo Type	Trading area	Trading in LNG?	Ship Owner / Operator
2016	Ocean Yield TBN**	36,000	Ethane/Ethylene	US - Teeside	Ethane, for Sabic	Gaschem Services
2017	Oizmendi	600	LNG	Bilbao	Yes	Itsas Gas
2017	CME TBN†	2,200	LNG	US Coast	Yes	CME
2017	CME TBN†	2,200	LNG	US Coast	Yes	CME
2017	ENGIE Zeebrugge	5,000	LNG	Northwest Europe	Yes	NYK
2017	Coralius	5,800	LNG	Northwest Europe/Baltics	Yes, for Skangas	Anthony Veder
2017	Cardissa	6,500	LNG	Northwest Europe	Yes	Shell
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	LNG-Gorskaya TBN	7,300	LNG	Russia	Yes	LNG-Gorskaya
2017	Coral EnergyICE	18,000	LNG	Northwest Europe/Baltics	Yes	Anthony Veder
2017	JS Ineos Invention	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2017	JS Ineos Intuition	27,500	LNG/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2017	Yuan He 1	30,000	LNG	China	Yes	CSR
2017	Navigator Eclipse	35,000	Ethane/Ethylene	US	Ethane	Navigator
2017	Navigator Nova	35,000	Ethane/Ethylene	US	Ethane	Navigator
2017	Navigator Prominence	35,000	Ethane/Ethylene	US	Ethane	Navigator
2018	HUA XIANG 8	13,720	LNG	China	Yes	Zhejiang Huaxiang
2018	CME TBN†	2,200	LNG	US Coast	Yes	CME
2018	Shell Bunker Barge TBN 4	3,000	LNG	Northwest Europe	Yes	Shell
2018	Shell Bunker Barge TBN 2	6,500	LNG	Northwest Europe	Yes	Shell
2018	Shell Bunker Barge TBN 3	6,500	LNG	Northwest Europe	Yes	Shell
2018	Kairos	7,500	LNG	Baltic	Yes	Bernhard Schulte
2018	Qi Yuan	28,000	LNG	China	Yes	Dalian Inteh Group
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Evergas TBN	32,000	Ethane/Ethylene	Markus Hook - Rafnes	Ethane, for Ineos	Evergas
2018	Bunker Breeze	0	LNG	Barcelona	Yes	Suardiaz Energy Shipping
2019	KLine TBN	7,500	LNG	Korea	Yes	Korea Line
2019	KLine TBN	7,500	LNG	Korea	Yes	Korea Line
2019	Stolt TBN	7,500	LNG	Mediterranean	Yes	Stolt-Nielsen Gas
2019	Stolt TBN	7,500	LNG	Mediterranean	Yes	Stolt-Nielsen Gas
2020	Shell Bunker Barge	4,000	LNG	US Coast	Yes	Q-LNG Transport/Harvey Gulf
2020	Stolt TBN (option) **	7,500	LNG		Yes	Stolt-Nielsen Gas
2020	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2020	Total TBN	18,600	LNG	NWE	Yes	MOL
2020	FuelLNG TBN	7,500	LNG	Singapore	Yes	FuelLNG
2020	CLS TBN	3,500	LNG	Japan	Yes	CLS
2020	Eesti Gaas TBN	6,000	LNG	NWE	Yes	Eesti Gaas
2020	ENN TBN	8,500	LNG	China	Yes	ENN
2021	Stolt TBN (option)	7,500	LNG		Yes	Stolt-Nielsen Gas
2021	Knutsen TBN	30,000	LNG	Mediterranean	Yes	Knutsen OAS
2021	Gazprom Neft TBN	5,800	LNG	Russia	Yes	Gazprom Neft
2021	PE TBN	12,000	LNG	Singapore	Yes	MOL
2021	JMU TBN	2,500	LNG	Japan	Yes	JMU
2022	Stolt TBN	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2022	Stolt TBN	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2024	Stolt TBN (option)	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2024	Stolt TBN (option)	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2026	Stolt TBN (option)	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas
2026	Stolt TBN (option)	20,000	LNG	Worldwide	Yes	Stolt-Nielsen Gas

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