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Flurry of discounted LNG cargoes stretch Europe's regas terminals

Capacity constraints at Europe's import terminals contrast with a flutter of LNG cargoes headed across the Atlantic. Some cargoes were offered at discounts of more than 20 percent to Europe's benchmark TTF gas prices as sellers scramble to secure regas slots, but much volume had to be diverted to Asia. Though the arbitrage for selling US LNG to Europe is forecast to stay higher through 2024, landed volumes are likely to fall over the summer; our Markets Editor Anja Karl was told.

Soaring LNG since early March was largely caused by the Commissions' REPowerEU plan, stipulating to remove at least 155 Bcm of fossil gas, equivalent to the volume imported from Russia in 2021. Two-thirds of these cuts are envisaged before year-end – clashing with requests to replenish gas storage to 80 percent capacity by November 1. Prices at the Dutch TTF, Europe's benchmark gas trading hub, consequently rallied to record levels, exceeding prices for LNG cargoes delivered to Northeast Asia.

“The arbitrage from the US to Asia and Europe is pretty wide open. It is higher to Europe for all the months up to 2024, and this has driven substantial

amounts of US LNG to the region as Asian buyers are unlikely to return to the spot market before late summer and going into the winter. But with capacity constraints in Europe – rather than waiting to get a regas slot – a lot of US LNG cargoes are being diverted to Asia despite the higher arbitrage to Europe,” explained Kristen Holmquist, forecasting manager at Poten & Partners.

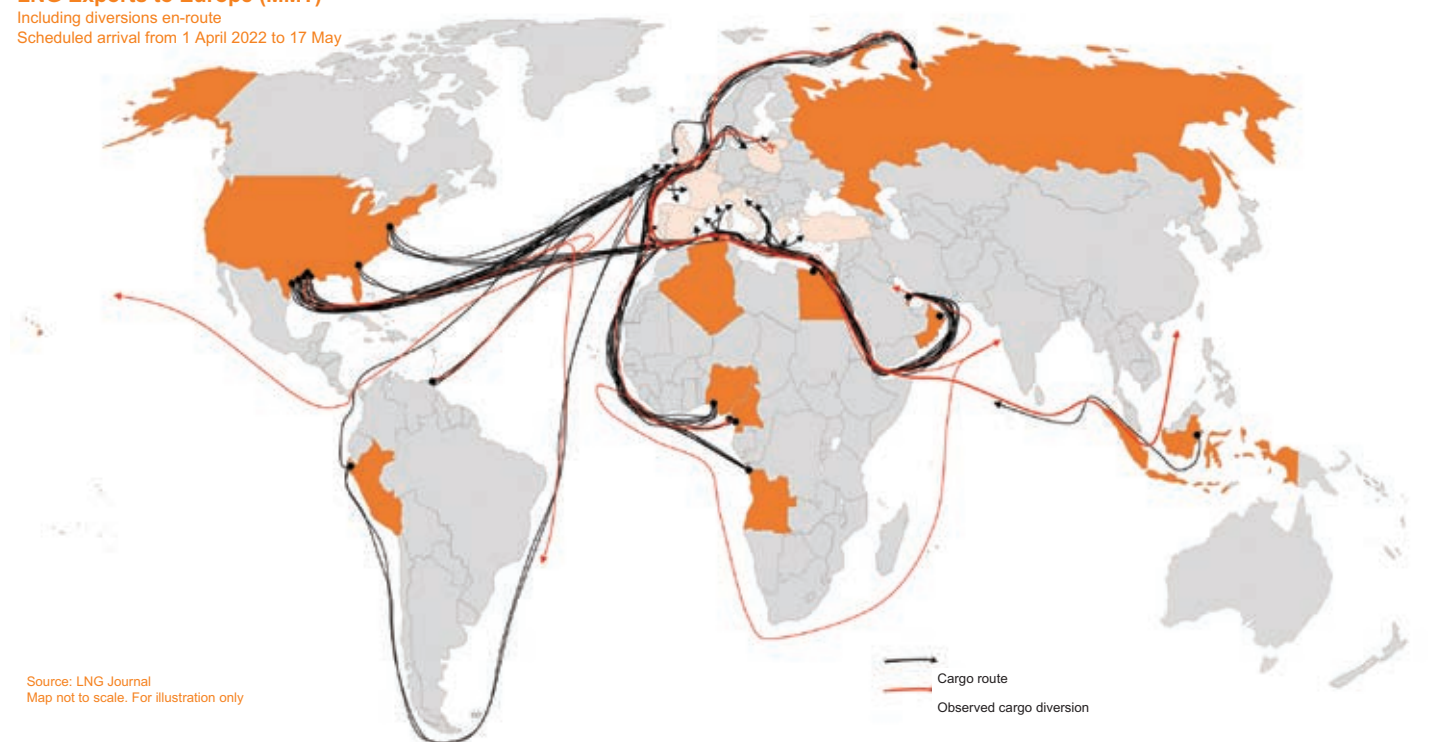
“From what we are hearing all the slots in Europe have been booked – so they are reverting some cargoes to Asia. Discounts to the TTF that LNG importers are getting are extremely high, up from \$5 per MMBtu to currently \$10 per MMBtu,” Holmquist said. “So even though TTF prices are very high, the

importers are not getting that price because the cost of regasification slots have gone up due to capacity constraints.”

In fact, *LNG Journal's* ship tracking data shows eight in-route diversions away from Europe for the period between April 1 and May 23: Two of these cargoes originated from Venture Global's Calcasieu Pass LNG in Louisiana, US, and cargoes were initially meant to be delivered to Dunkerque in France and South Hook in the UK, before being diverted (*see table*). Much more such in-route diversions occurred, but not all are visible on the AIS platform.

Regasification terminals in France, Italy, Turkey, Belgium and the Netherlands have been running way

LNG Exports to Europe (MMT)
Including diversions en-route
Scheduled arrival from 1 April 2022 to 17 May



Source: LNG Journal
Map not to scale. For illustration only

Export Country	Export Facility	Vessel Name	IMO Number	Sailed Date	Import Country	Import Facility	Arrival Date	Delivered MMT	Diverted from
Malaysia	Malaysia LNG	LNG Adventure	9870159	01-Apr-22	Bangladesh	Maheshkhali FSRU 'Excellence'	07-Apr-22	0.08	Fos-sur-Mer
USA	Calcasieu Pass LNG	Nohshu Maru	9796781	17-Mar-22	Japan	Futtsu	15-Apr-22	0.06	Dunkerque Le Clifton
Russia	Yamal LNG	Clean Vision	9655456	07-Mar-22	China	Jiangsu LNG	18-Apr-22	0.07	Bahia de Bizkaia LNG
Cameroon	Cameroon FLNG	Velikiy Novgorod	9630004	07-Feb-22	India	Dabhol	02-May-22	0.07	Kaliningrad FSRU
Cameroon	Cameroon FLNG	Pskov	9630028	13-Mar-22	India	Mundra LNG	03-May-22	0.04	Kaliningrad FSRU
Equatorial Guinea	EG LNG	Maran Gas Mystras	9658238	02-Apr-22	India	Dahej	07-May-22	0.07	Europe
Trinidad & Tobago	Atlantic LNG	Pan Europe	9750244	13-Apr-22	Kuwait	Al Zour LNG	12-May-22	0.07	Maasvlakte Gate Terminal
USA	Calcasieu Pass LNG	Hoegh Esperanza	9780354	05-May-22	Brazil	Salvador FSRU	25-May-22	0.07	South Hook LNG
USA	Cove Point LNG	British Sponsor	9766580	05-May-22	Pacific Basin	TBC	04-Jun-22*	0.08	Sagunto
USA	Sabine Pass LNG	LNG Abalamable	9690171	18-May-22	Pacific Basin	TBC	15-Jun-22*	0.06	Rovigo Adriatic LNG

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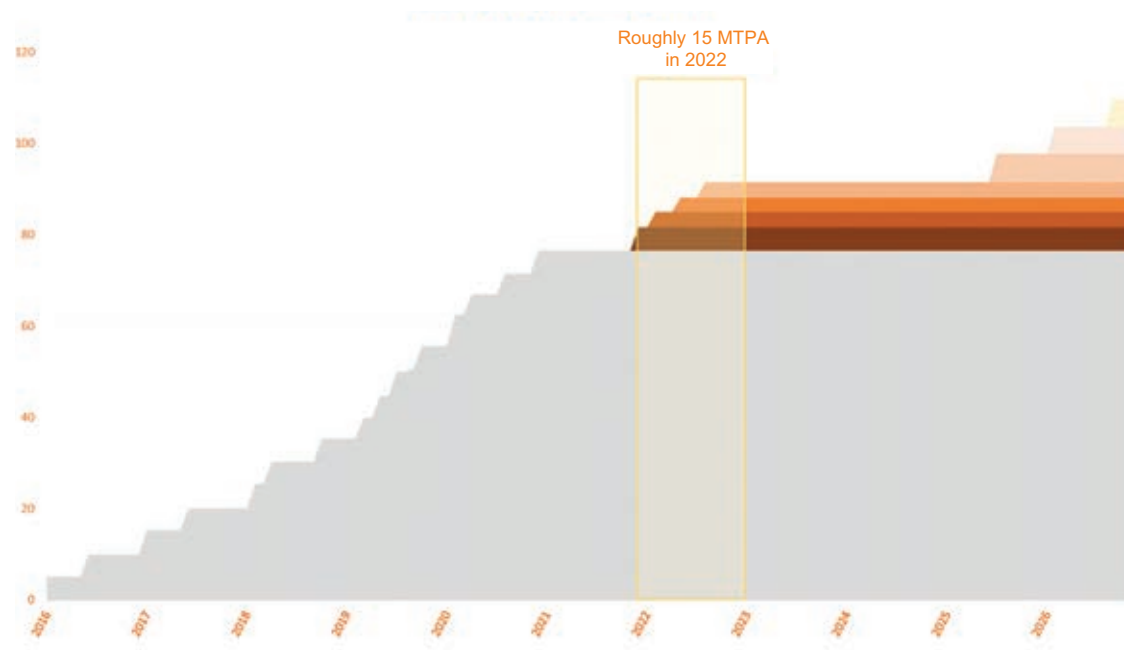
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US LNG Capacity Outlook (MPTA)



Source: LNG Journal

above their nameplate capacity – some terminals were seen operating at 200 percent. This is unsustainable in the long-run, so analysts expect imports to fall to around 7-8 million tons per months over the summer – now that Europe's gas inventories have been filled up to levels within their five-year average.

TTF prices spiked in February when Russia started to invade Ukraine, and TTF futures today are still way higher than corresponding prices in Asia: TTF future contracts for June were last seen at \$91.025 per MMBtu and at \$93.555 per MMBtu for July on CME's trading platform, while the Japan Korea Marker (JKM) contract for July stood at just \$21.79 per MMBtu – favouring shipments to Europe. In fact, some 80 percent of US LNG exports have been shipped to Europe in March through April, analysts at Poten & Partners shipbrokers noted.

US plants run "too hard"

The United States has become the swing supplier on global gas markets. US LNG accounted for nearly two-third of the world's supply increase, soaring 49 percent last year to 75 million tons per annum (mtpa). To achieve such growth, most American liquefaction plants have been running way above their nameplate capacity, but this is unlikely to continue for the rest of the year.

"It's just not possible to keep them running this hard," Holmquist said, warning any prolonged overstretch of US liquefaction plants increases the risk of technical glitches and lengthy maintenance outages.

US government analysts, meanwhile, say LNG exports will stay on record high

levels throughout the quieter summer season from May to August despite high Henry Hub prices. "We expect U.S. LNG exports to average 12.0 billion cubic feet per day (Bcf/d), this year, a 23 percent increase from 2021 analysts at the US Energy Information Administration (EIA) noted in their latest short-term energy outlook. In April, US LNG exports averaged 11.6 Bcf/d, slightly below an all-time peak of almost 12.0 Bcf/d set in March, and the EIA estimates exports from May through August will average 12.1 Bcf/d – slightly lower than previously forecast.

Sellers speed up projects

Eager to cash in on Europe's quest to diversify gas sources, US developers have been trying to revive several liquefaction and export projects – particularly those with all permits in place. "A lot to the strength in the market has been shifted to sellers or project developers. They are seeking a shorter validity time between the negotiations and signing of a Heads of Agreement (HoA) to the conversion into a Sales & Purchase Agreement (SPA). That used to take a long time but developers are basically saying: 'You've gotta sign up now so we can take FID and start construction'," Holmquist pointed out.

High demand in Europe could boost US LNG exports by 2.4 Bcf/d this year to 12.2 Bcf/d and by a further 0.5 Bcf/d in 2023. The addition of Sabine Pass Train 6 and capacity expansions at Sabine Pass and Corpus Christi LNG export terminals helped increase liquefaction and send-out capacity from already high levels. Train 6 adds up to 76 Bcf/d of peak export capacity while Calcasieu

Pass LNG is expected to be operational later this year with yet another 12 mtpa or 1.6 Bcf/d.

But even as several more projects are about to take FID, Poten does not expect them to add new LNG volumes to global markets before 2025 or 2026. This view corresponds with the one of EIA analysts who caution that growth in US LNG exports will slow to 5 percent in 2023, with liquefaction capacity averaging 12.6 Bcf/d for the year.

Term LNG prices rise

The attraction of US cargoes is that the volumes are sold FOB (free on board) and that buyers have cargo cancellation rights, which gives them great flexibility. Prices have gone up, however, and the ratio for Brent-linked LNG contract has increased to reflect tighter markets: "We are hearing some people are looking at indexations of 15 percent of Brent [for 10-15 years supply contracts], while last year we were in the low 10 percent," Holmquist revealed.

Henry Hub-linked LNG prices have increased as well by 10-15 cents per MMBtu for a 15 to 20-year supply contract. "We have seen liquefaction fees of 1.75 to above \$2.15 per MMBtu – so there is strength in terms of the US projects being able to capture additional value," she commented. In addition, the spread between the contract price of LNG, estimated at 11 percent of Brent crude oil, and spot JKM and TTF gas prices started to widen starting from September 2021, according to Poten figures.

Strikingly, LNG exports from Russia have remained high – even higher than at the start of last year – despite Gazprom's sudden stop of pipeline gas deliveries to Bulgaria and Poland. Europe for the past four months has been importing large amounts of LNG as the region is striving to cover current demand while also filling up underground storage prior to the autumn and winter season. "That's hard to do on an LNG basis," Holmquist commented. Shipments of Russian LNG from Yamal to France and Belgium have risen to nearly 2 million tons per month and 1.1 mmt/m, respectively, since the Kremlin ordered an invasion into Ukraine, up from 1.5 mmt/m and



Uniper and RWE have leased two FSRUs each

0.6 mmt/ in November through January. In contrast, the UK has only taken one cargo as they banned the import of Russian volumes which are replaced mostly with US LNG – hence Gazprom is looking to step up sales in Asia, notably China and India.

Europeans slower to commit than Asians

Looking at the demand side, it is not only European buyers that are interested in US LNG but also players from China, Taiwan, Japan, Korea and Southeast Asia are looking to lift volumes. A lot of this activity is being done through aggregators. “But Europeans tend to commit not as quickly as Asians. They have to coordinate these decisions with downstream players and their governments,” so Poten sees “a little bit of lag in these decisions” not least because the price of Russian pipeline gas is very attractive compared to LNG deliveries.

“So far, we haven’t been seeing European buyers walk away from their gas supply agreements (GSAs) with Russia because there aren’t sanctions as of yet,” Holmquist commented. Her analyst colleague Jon McDonald added that Russian LNG exports have actually increased by 10 percent as liquefaction plants are operating at an estimate 130 percent of nameplate capacity.

Russia reroutes LNG to Asia

In the first half of 2022, exports of Russian LNG are forecast to be higher at about 10.5 mtpa as opposed to 9.7 mtpa during the same period last year. “And as the northern Arctic route is opening (getting ice-free) most cargoes from Yamal will be shipped to Asia,” he said, anticipating an impact on European gas pricing in the coming weeks.

In fact, limits to Europe’s regas capacity not only prompt LNG diversion but has also been pushing the market to sustain imports of Russian pipeline gas.

The LNG equivalent of all Russian pipeline gas going into Europe is about 77 million tons, or 20 percent of the total LNG export market in 2022 which is just shy of China’s total demand. “So, taking Russian gas out of the global market is like taking China out of the market,” McDonald explained. In his view, “sourcing sufficient volumes of additional LNG to substitute for Russian energy is barely feasible as utilization rates of liquefaction plants in Australia, Qatar and the US are already running at, or near, maximum capacity.” Infrastructure constraints on the export side hamper LNG to fully replace deliveries of Russian pipeline gas to Europe.

Today, with Russia’s contractual pipeline gas deliveries to Western Europe continuing on fairly high levels, signing a long-term LNG import contract could leave the buyer with excess volumes. “You’d be buying LNG in case something happened with Russia but you could get stuck with excess supply,” McDonald said. In terms of sustainability, there is also an issue with making a 15 to 20 years contract commitment when most European countries have Net Zero

emission targets by 2040.

Europe’s total LNG imports are anticipated at around 100 million in 2022 – provided Gazprom does not cut off pipeline gas supplies to other EU countries than Poland and Bulgaria – but the key question is how much Russian gas can be diverted to China and India. “Not a lot,” analysts reckon, who just lowered their forecasts of Chinese gas demand due to Covid-19-related lockdowns. China’s LNG imports are now expected to total 78 million tons in 2022.

Globally, LNG imports are forecast to rise by 6 percent this year despite the high price environment. “Growth is highest in Europe and the Mediterranean due to the low gas storage levels coming out of last winter. “Growth is up about 60 percent for the first four month of 2022, compared to 2021, in northwest Europe and about 50 percent in the Med, so imports jumped from 40 million tons from Jan-April last year to 60 million tons this year,” McDonalds explained.

Utility buyers turn to coal

Coal demand has become resurgent, too, in addition to Europe’s rising gas demand. “People are buying gas but there is a limit on how much they can get. Instead, utility buyers are turning to coal and some countries are starting to re-commission mothballed coal power stations to wean off their dependence on Russian gas imports. The price of coal has spiked amid rising demand, though it is still relatively cheap compared with natural gas.

Germany, heavily dependent on Russian energy imports, strives to accelerate the renewables build-out,

considers extending the runtime of some coal power station and seeks to fast-track the operational start of new floating LNG terminals. “If we have full storage facilities at the turn of the year, if two of the four floating LNG tankers we have rented are already connected to the grid and if we save a lot of energy, we will be able to get through the winter reasonably well in the event of a cut in Russian gas supplies,” said Germany’s economy minister Robert Habeck.

Two of the four FLNG vessels that Germany has leased are already operational and replace around a quarter of current Russian pipeline gas deliveries, Habeck suggested. One of the FSRU’s chartered by Uniper from Dynagas is ready for use in the port of Wilhelmshaven. The FSRU has an import and regas capacity of up to 7.5 Bcm/y, Uniper said, estimating it could cover about 8.5% of Germany’s future gas demand starting from this winter.

Rival utility RWE has also chartered two FSRUs on behalf of the German government, each capable of receiving up to 170,000 cbm of LNG in one go. The plan is for the FSRU platforms to start operating as early as next winter, RWE announced though it has not determined both unloading sites. Wilhelmshaven was recently chosen as one location but the second FSRU might either be situated in Brunsbüttel, Rostock or Stade.

Fitch Rating, however, is less optimistic about the timeline of Germany’s switch to LNG. Analysts warned a sudden stop in Russian gas imports would have severe and far-reaching ramifications that could plunge Europe’s largest economy into recession. ■

Slots at Grain LNG in high demand to mitigate freeze on Russian gas

Grain LNG, Europe’s largest LNG import terminal in Kent, UK, has achieved a record 67% utilisation rate in April and more cargoes set to come as British LNG regas terminals help mitigate the impact of a freeze on Russian gas felt across Europe. All regas slots at Grain LNG are currently fully contracted and capacity will not become available before the end of 2028.

“Grain LNG intends to launch an Open Season to market this capacity in the near future,” announced Importation Terminal Manager Simon Culkin.

Though UK gas demand is “about average for this time of year,” he noted

increased deliveries headed to Grain LNG and other terminals in northwest Europe as importers are rushing to source non-Russian gas.

Simultaneous unloads

Expansion works are underway at Grain LNG based on a contract signed with Qatar Terminal in 2020. The site storage will increase to 1.2 million cubic meters from mid-July 2025, and the regasification capacity will increase to 800 GWh per day. As part of the expansion project, Grain will be commissioning a second cryogenic unloading line – and will be the only terminal in Europe able to perform

simultaneous unloads.

Already today, the site in Kent hosts the largest terminal in Europe and eighth largest in the world by tank capacity, on an area spanning over 600 acres. Regasified LNG imported through the Grain terminal has direct access to the UK’s NBP – one of Europe’s largest trading hub next to the Dutch TTF.

National Grid, the electricity transmission operator in England and Wales, operates Grain LNG. The terminal is of strategic importance for Britain’s gas supply with the terminal exporting a daily average of 431 GWh of gas in April, nearly 10 GWh more than its previous record set a year ago. ■

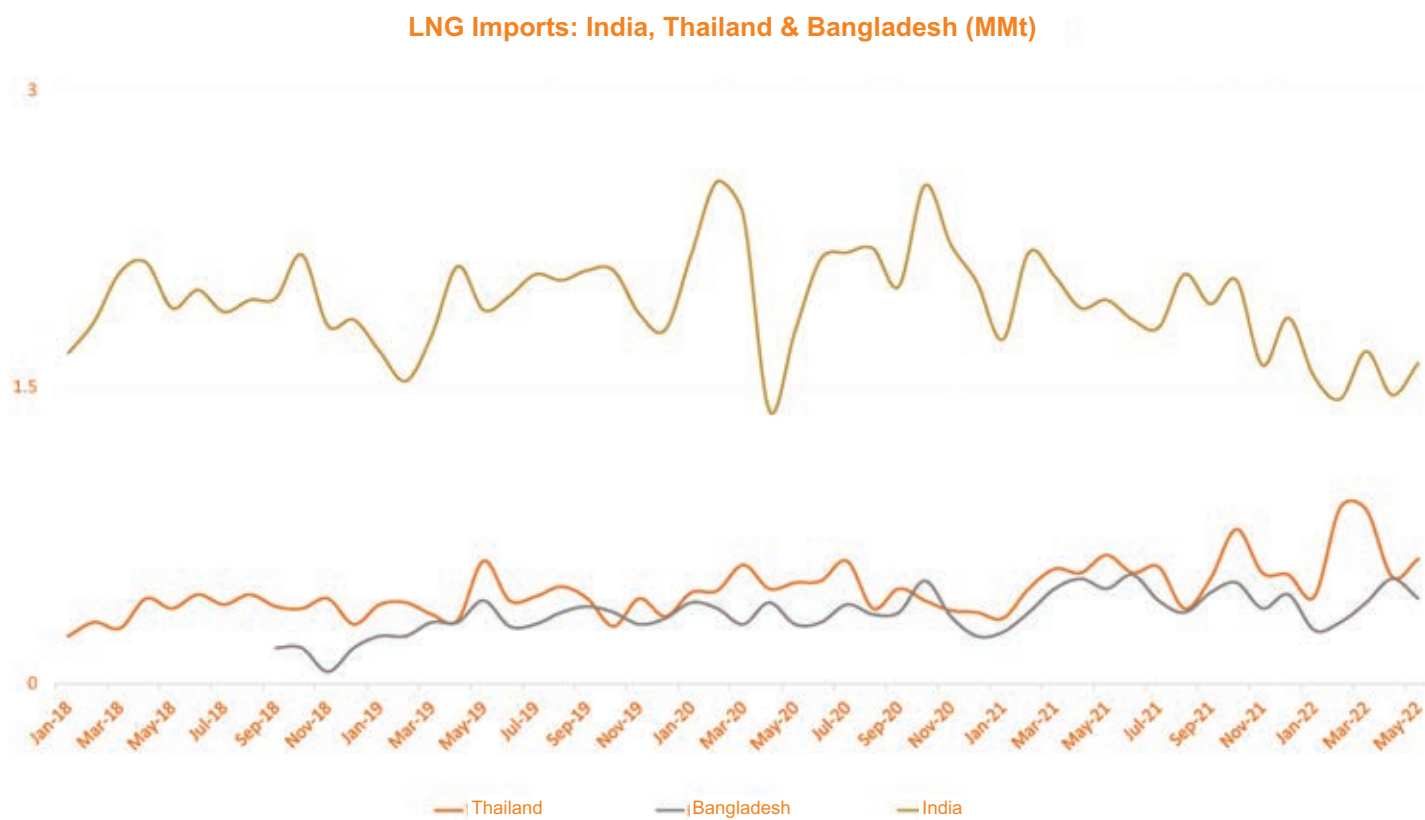
Thailand set for accelerated LNG demand growth

Thailand's LNG demand has grown significantly since 2018 but recent production issues of domestic gas are likely to accelerate the country's ascent as a leading LNG importer; our Markets Editor Alexander Wilk reports.

The Thai government has given natural gas a prominent role in the country's energy mix. Part of that policy is underpinned by ambitions to become carbon neutral by 2070 – announced in the National Energy Plan 2022 – for which natural gas is a crucial transition fuel. However, Thailand already relies on natural gas to generate more than half of its electricity, according to the IEA. With production issues at its main Erawan gas field and risk of tighter sanctions on significant pipeline gas supplier Myanmar, Thailand is thus facing sustained high demand growth that will accelerate the country's ascent as a leading LNG importer even as prices have reached record highs. Platts reported that the spot prices Thailand paid towards the end of last year were up to 19.5 percent higher than the Platts JKM index at the time. Currently, the only silver lining for Thailand, in the near term, is the sharp decrease of European imports due to capacity constraints that may ease some of the competition for available cargoes. The Thai economy is highly geared towards gas for its energy needs, which makes switching away difficult.

Long gas tradition

Thailand began developing its domestic gas reserves in 1981, not for export but to provide for power generation to fuel its fast-growing economy. In 2020, electricity production accounted for around 75 percent of total gas demand (this figure has since moved closer to 60 percent due to electricity imports from Laos and investment in renewables). Apart from domestically sourced supply, the country has two gas contracts totalling 11.35bcm with neighbouring Myanmar, which covered around 28 percent of total gas demand in 2020 (the last full-year data set by the government). However, 9bcm worth of Burmese supply is due to end in 2025 and the remaining 2.35bcm in 2042. At the time of writing, it was still unclear to what extent – if at all – these contracts would be renewed. Meanwhile, the looming prospect of additional economic sanctions on Myanmar following a military coup in 2021 has also cast near-term uncertainty on continued gas imports from Myanmar.



In 2021, 54 percent of the country's electricity was generated with natural gas. Thailand has been pushing to expand its national electricity grid to underpin continued economic growth further inland. As such, four companies – Siam Gas and Petrochemical, Ratch Group, Gulf Energy Development and B. Grimm Power have announced ambitious plans to grow gas utilisation. Ratch Group, for instance, is vying for independent gas supply to feed its 1.4GW Hin Kong power plant in Ratchaburi by 2024-25. B. Grimm, meanwhile, plans to import LNG to feed seven 140MW gas-fired power plants currently under construction in more remote areas of Thailand.

Expanding LNG infrastructure

Meanwhile, Thailand has steadily expanded its LNG infrastructure, operated by Thai state-run hydrocarbon champion PTT. The Map Ta Phut terminal came onstream in 2011 with initial capacity of 5 million tonnes per annum (mtpa). The terminal's capacity was subsequently expanded to its current 11.5mtpa. The Thai government has repeatedly expressed its ambition to expand hydrocarbon capacity at Map Ta Phut as part of an Energy Ministry plan to promote Thailand as an LNG hub, according to the Bangkok Post. Current

plans foresee Map Ta Phut's capacity being upgraded to 16.5mtpa by 2025.

Additionally, two other LNG projects are under development. The Nong Fab terminal is currently under construction in the Southeast of the country and was designed with capacity of 7.5mtpa. The project's estimated completion is end-2022.

Meanwhile, the proposed Surat Thani FSRU project in southwest Thailand is a 3mtpa project co-developed by Thailand's state-owned power utility Electricity Generating Authority of Thailand (EGAT) and PTT. The Surat Thani FSRU would replace a larger FSRU planned by EGAT in the Gulf of Thailand, initially expected to supply its South Bangkok power plant. However, EGAT's initial plan was scrapped by the National Energy Policy Council (NEPC). The new joint project would supply gas to a new 1,400 MW gas-fired power plant developed by EGAT in the Phunphin district and is planned to be commissioned between 2027 and 2029.

Power imports

Thailand's national gas plan implies the country will have to import more than 24mtpa by 2027 as commercially viable gas reserves in the Gulf of Thailand and the Gulf of Martaban will be depleted and pollution from burning lignite is to be contained. Costs for locally produced gas,

however, have continued to grow, with a likelihood to rise further as PTT is forced to employ more field support measures to prevent production from collapsing.

Meanwhile, Thailand has also invested in electricity imports from Laos via the 'Battery of Southeast Asia' scheme. According to the Stimson Mekong Infrastructure Tracker, a tool published by The Henry L. Stimson Center, Thai investors hold stakes in most of the existing power capacity and have considerable sway over capital flows into new power projects in Laos. Whilst government data show Thai electricity imports from Laos were around 33,356GWh generated from 5.72GW in installed capacity in 2021, that represents only around 18 percent of Thailand's electricity consumption that year. An increase to an installed capacity ceiling of 9.0GW with the help of Thai investments is slated only by 2037. To do so would rely on the 'Battery of Southeast Asia' scheme, which aims to exploit Laos' vast hydropower potential through several proposed dams on the mainstream of the Mekong River. However, a 2022 report by the Stimson Center highlights that the unfettered construction of dams currently under consideration by the Thai Ministry of Energy is facing increasing opposition from both the public and other government bureaus such as the Office of



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National Water Resources due to potentially adverse environmental and ecological consequences. It is therefore uncertain at this point to what extent Thailand's electricity demand growth will be adequately met by higher electricity imports.

Accordingly, Thailand has ascended as one of Southeast Asia's key LNG importers, with year-on-year demand growth exceeding that of Bangladesh. Bangladesh's current import infrastructure is limited to two FSRUs, which saw combined utilisation of almost 70 percent in 2021, according to our data. Moreover, Thailand's strong demand growth contrasts with India's slide in demand since January 2021.

Supply shortfall

Despite ambitious plans to expand infrastructure and provide an expansive role for gas in its energy mix, Thailand has recently been struggling with a gas supply shortfall. The deficit is underpinned by lower output from the offshore Erawan field, Thailand's main source of domestically produced gas.

This stands in stark contrast to the country's position roughly a year ago when state-owned PTT completed its first LNG re-export out of surplus supply. The cargo was delivered to Japanese utility TEPCO's Higashi-Ogishima terminal in the greater Tokyo area. PTT likely took advantage of significant arbitrage between its own fixed import contracts and high Northeast Asian spot prices at the beginning of 2021. The Thai government explained the trade as part of a strategy to mitigate future LNG demand risk to its economy by becoming

an Asian LNG trading hub.

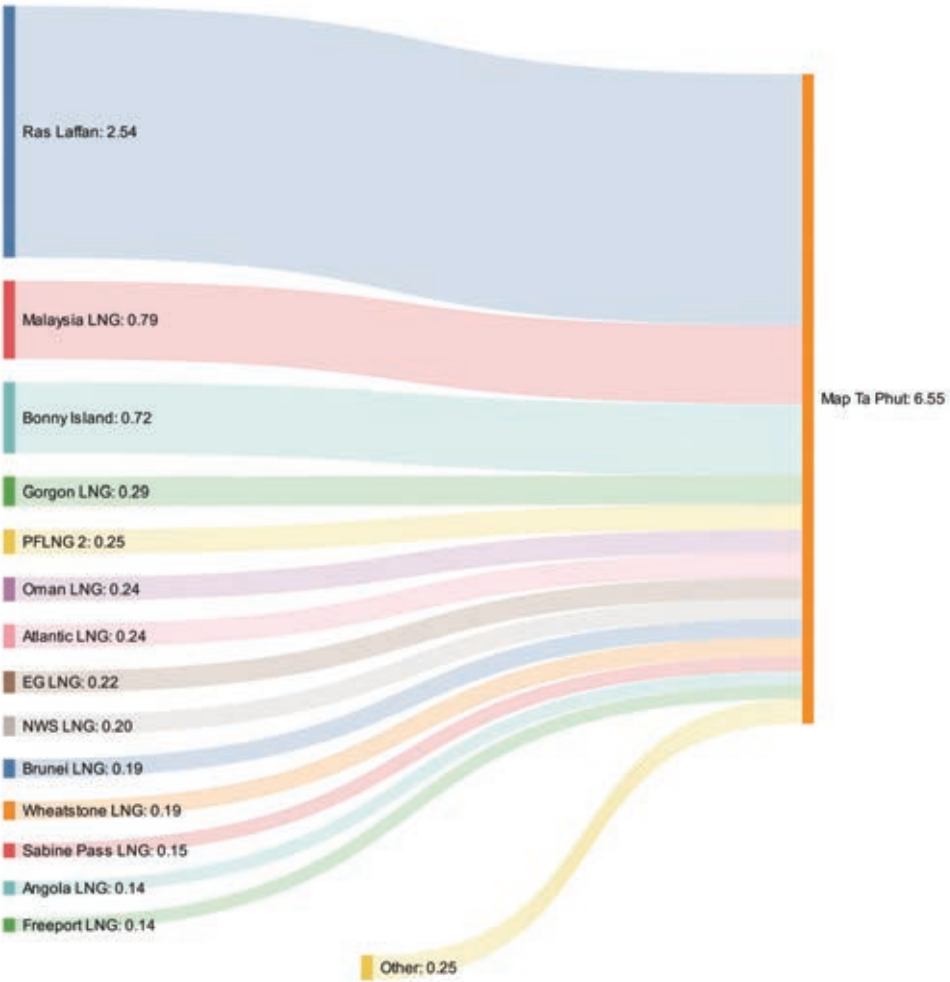
As we have reported before and outlined again above, ageing fields require continued investment to prevent production collapse. Unfortunately, that investment had stalled, according to Reuters, as PTT Exploration and Production (PTTEP), a subsidiary of state-owned energy champion PTT, and Chevron were initially unable to agree on access to the field in 2021 and during 1Q 2022. Consequently, Erawan's gas production was predicted to fall to just 20 percent of its nominal capacity from April this year. Crucially, although the handover between Chevron and PTTEP was completed in late April, according to Thai news outlet The Nation, it will likely take considerable time for Erawan to regain a significant portion of its former output.

Production issues in Southeast Asia are not new as many of the regional fields are maturing. Even before the current handover issues at the Erawan field, Thailand's gas production was in long-term decline. Similar production issues can be observed in Malaysia and Indonesia.

To offset Erawan's decline, the Energy Regulatory Commission (ERC) has increased LNG import quotas to 9.70mmt this year from 6.40mmt last year. According to our data, last year's imports of 6.55mmt already slightly exceeded the 2021 quota by 0.15mmt (2 percent).

Thailand is likely to have little choice but to compete for additional gas supplies at a time when demand elsewhere is also trending up. As we reported last month, European utilities are rushing to secure additional cargoes to replace Russian

LNG Flows to Thailand, 2021



Source: LNG Journal

pipeline gas with LNG in connection to economic sanctions on Russia. The only silver lining for Thailand, in the near term, is the current sharp decrease in European imports due to capacity constraints. However, such constraints cannot persist if declared policy goals of cutting back on Russian gas imports and stocking up ahead of winter are to be fulfilled.

Ready for more LNG

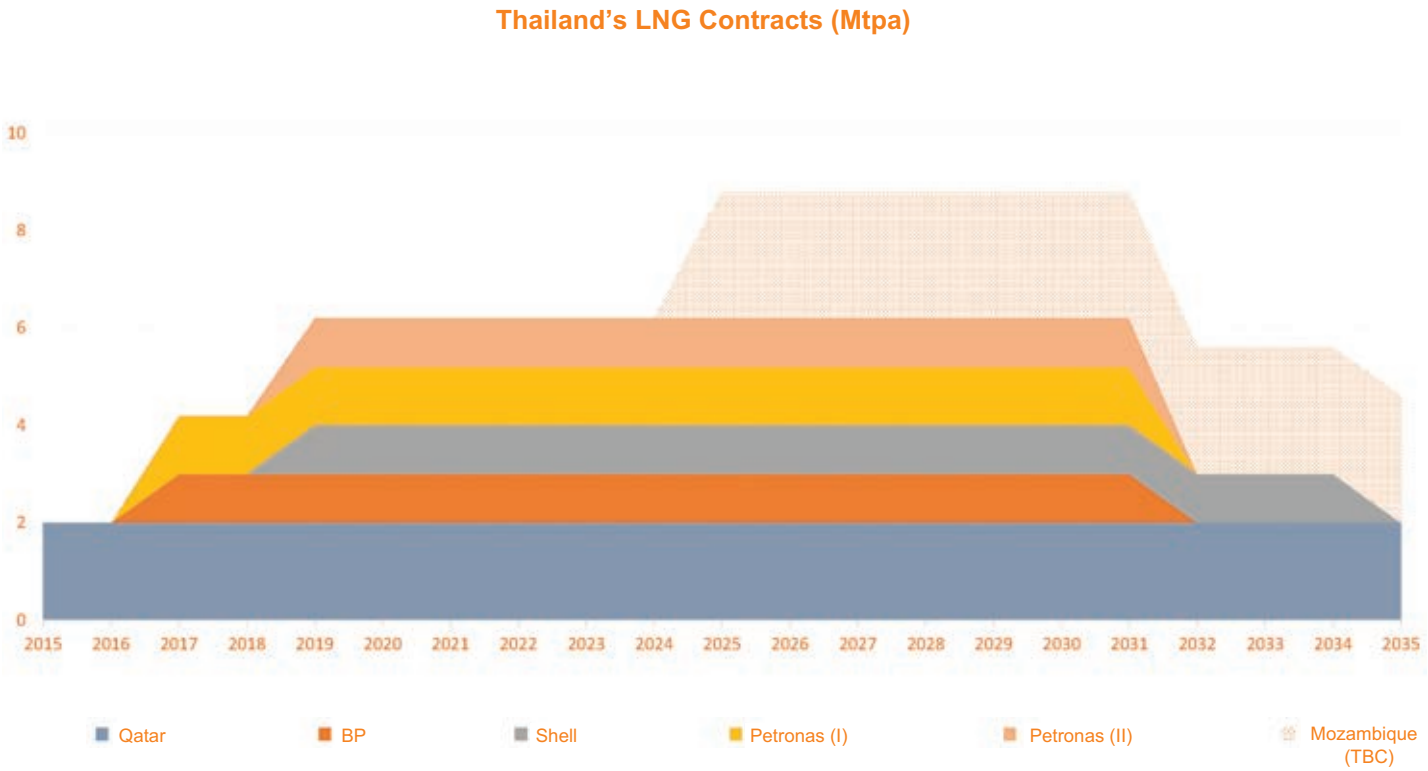
Thailand's LNG import capacity remains subject to a restrictive licensing and

quota regime, which was originally intended to enable the government to control costs. Nevertheless, the government announced in March it was planning to commence partial operations at Nong Fab in May, adding around 2.50mtpa of capacity six months ahead of schedule. Although Thailand still has headroom with existing capacity, the move to advance commercial operations at Nong Fab ahead of schedule comes as an additional security measure should gas supplies from Myanmar cease this year.

Thailand purchases much of its LNG on a spot basis or on short-term contracts. The country is also supplied by long-term contracts with Qatar, BP, Shell and Petronas amounting to 6.2mtpa, with the earliest expiration date in 2031. All the above contracts have PTT as the buyer.

The Thai government expects LNG imports to rise to 20mtpa by 2025. PTT is also betting on Thailand emerging as Southeast Asia's latest LNG trading hub to better manage its procurement plans, which remain uncertain in the long term. The company plans to use the Nong Fab terminal and the spare capacity at Map Ta Phut to support its LNG trading ambitions.

Thailand's surplus LNG import capacity could allow it to capture a share of Asia's LNG trade, especially among



Source: LNG Journal

smaller regional newcomers including the Philippines, Myanmar, Vietnam and possibly Cambodia. These countries, many of which are proposing small-to-mid-size LNG-to-power projects, are seeking short-term flexible supply deals as they tentatively enter the market. India is also seeking to expand its LNG infrastructure on its eastern shores. We think this provides compelling commercial potential for PTT, which established an LNG trading desk in Singapore in February 2019.

Deregulation

Facing pressure to make its gas market more flexible, the Thai government has been active in adjusting its licensing regime. Several new gas import projects have been proposed, two of which were in concert with license applications by Thai independent energy producer Gulf Energy and State-backed utility EGAT, aimed at breaking PTT's monopoly on LNG imports. However, other licenses encompass relatively small amounts of c. 0.20mtpa or are granted to PTT subsidiaries.

Nevertheless, these license approvals are a sign the government is moving

forward in liberalising and diversifying the country's gas market. EGAT first broke PTT's monopoly on LNG imports when it imported its first cargo from Malaysia's Petronas in December 2019 after becoming the first PTT competitor to receive an LNG import licence. Gulf Energy's permit encompasses the import of 1.7mtpa to fuel 19 small-scale gas-fired power plants across the country. In addition, Hin Kong Power – in which Gulf holds a 49 percent stake alongside Thai power producer Ratch Group – was also granted a licence to independently import 1.4mtpa. These volumes are earmarked to supply the proposed 1.4GW gas-fired power plant in Ratchaburi province from 2024.

However, we also highlight that although under Thailand's third-party access (TPA) rules PTT would have to provide storage capacity to EGAT until the latter's LNG stock has gradually been fed into its thermal power stations, PTT is bound by 'take or pay' clauses regardless of domestic LNG demand. This has previously led the Thai government to deny EGAT permission to enter a long-term supply contract of its own with Malaysia's Petronas. Instead, EGAT has

been limited to buying relatively small volumes of LNG intermittently on the spot market since December 2020.

Meanwhile, EGAT has already been purchasing gas under long-term contracts from PTT. As neither PTT nor EGAT is nominally licensed to re-export any excess gas they have bought before 2023, Thailand's prime gas supplier has thus remained state-owned PTT.

Concluding thoughts

Thailand is facing a roster of gas supply issues ranging from sanctions on its leading gas supplier Myanmar, faltering domestic production and record-high LNG prices. However, the country will have little choice in the near term but to

procure expensive LNG.

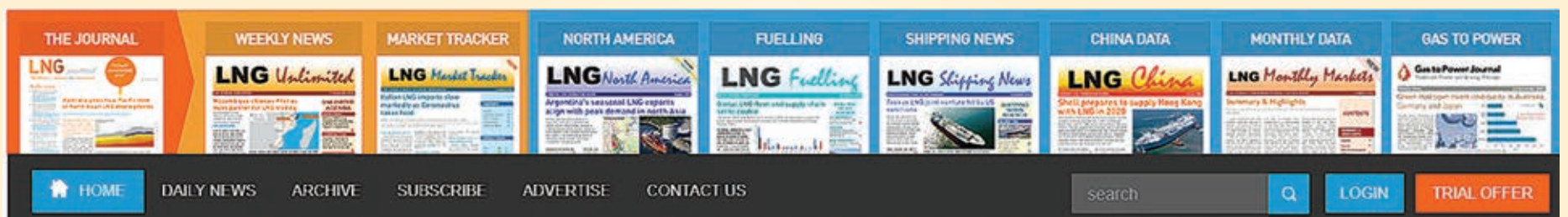
Indeed, the

Thailand's surplus LNG import capacity could allow it to capture a share of Asia's LNG trade, especially among smaller regional newcomers

government has recognised this and accelerated the commissioning of new import capacity where possible. Accordingly, whilst regulatory issues were still persisting, Thailand is set for continued

LNG demand growth if it wants to achieve its ambitious climate goals, for which it needs gas as a transition fuel. ■

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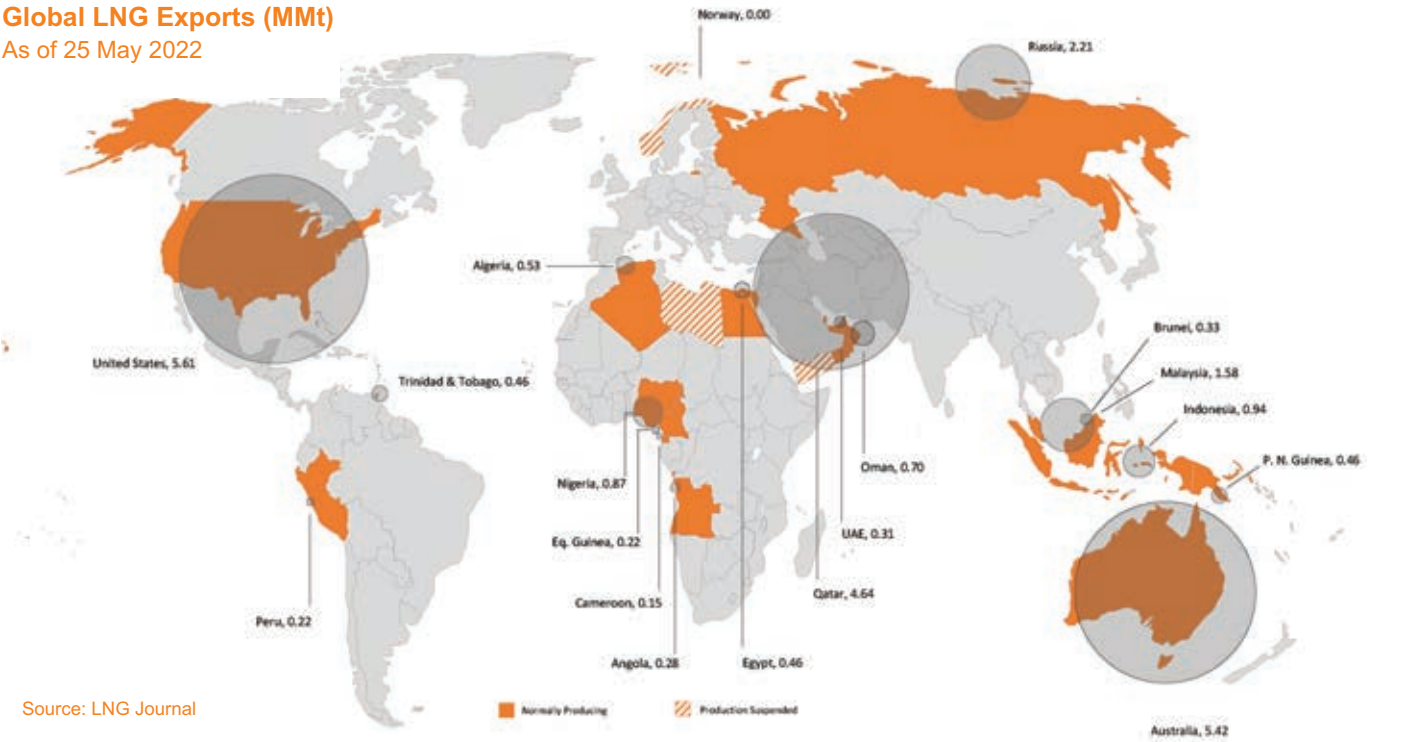
Preliminary data points to negative trade growth in May

Our preliminary May data point to a decrease in LNG flows as volumes had still to overcome a significant difference compared to April at the time of writing, our Markets Editor Alexander Wilk reports.

At 25.39mmt, our preliminary data showed global LNG trade had decreased by 2.10mmt (-8 percent) during the first 25 days of May (the report period) compared to 27.49mmt for the equivalent period in April. The shipped amount was also slightly below the 26.02mmt exported by 25 May 2021. In volume terms, exports were led by the Pacific Basin although it was only in the Atlantic Basin where exports were broadly on par compared to their equivalent for the first 25 days in April. Meanwhile, Middle Eastern exports had slumped period-on-period as Qatar cut back on shipments.

Concurrently, global LNG demand for the month up to 25 May was shaped to a large extent by the normally price-conscious roster of Southeast Asian buyers as well as demand growth in South America and the Middle East. European offtakes remained broadly steady period-on-period.

Global LNG Exports (MMt)
As of 25 May 2022



Source: LNG Journal

Exports

On 25 May, global exports at 25.39mmt had decreased by 2.10mmt (-8 percent) compared to 27.49mmt for the equivalent

period in April. None of the three Basin had achieved export growth over the equivalent April period. Atlantic Basin shipments were down by 0.28mmt (-3 percent) whilst Pacific Basin exports also saw negative growth in May to date, down by 0.43mmt (-4 percent). Middle Eastern shipments showed the most significant period-on-period deficit of 1.39mmt (-18 percent).

Pacific Basin

Pacific exports had reached 9.66mmt at the time of writing, coming in below their equivalent April volume of 10.09mmt by 0.43mmt (-4 percent). Consequently, capacity utilisation for the period stood at 86 percent at the time of writing.

Australia

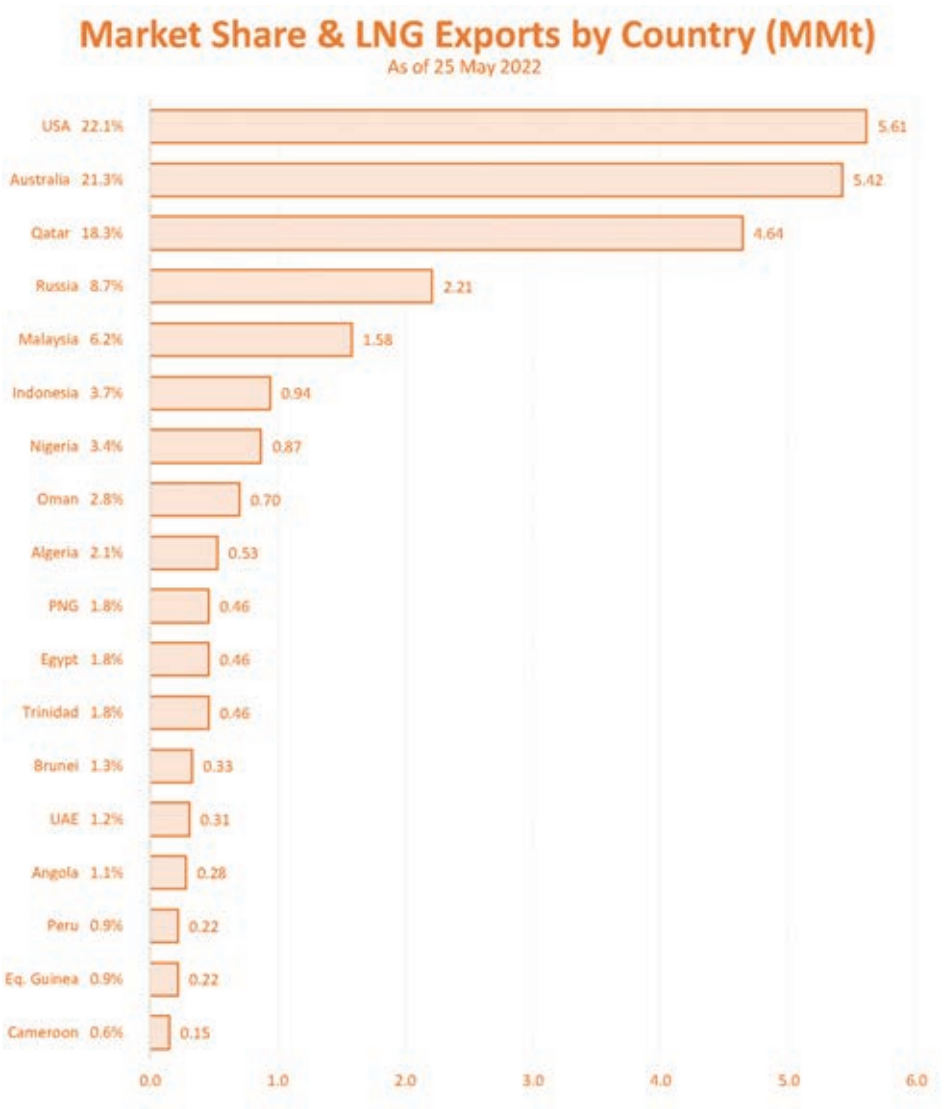
In contrast to most other exporters in the Pacific, the Basin's most significant exporter by installed capacity – Australia – increased exports during the first 25 days of the month by 0.18mmt (3 percent) from 5.24mmt in April to 5.42mmt in May. A rebound in exports by 0.35mmt (250 percent) at Wheatstone LNG was a leading factor. Wheatstone LNG exported 0.49mmt compared to the 0.14mmt in April. Exports from Gladstone LNG also increased by 0.17mmt (49 percent) from 0.35mmt to 0.52mmt. This was followed by Darwin LNG, where at 0.14mmt

shipments were up by 0.02mmt (17 percent) from 0.12mmt in April. NWS LNG had kept exports steady at 0.90mmt. Concurrently, Ichthys LNG and Queensland Curtis LNG had barely kept exports steady in volume terms at 0.90mmt and 0.57mmt, respectively, at the time of writing. There were also more significant export reductions during the report-period up to 25 May. Australia Pacific LNG and Gorgon LNG both curtailed shipments by 0.14mmt to 0.58mmt (-19 percent) and 1.22mmt (-10 percent), respectively. Pluto LNG also saw a significant reduction in exports by 0.08mmt (-22 percent) to 0.28mmt from 0.36mmt.

Shell's Prelude FLNG barge, meanwhile, continued to be seen in the market with three shipments totalling 0.20mmt. The facility thus managed to increase output from April. Following the three May shipments to date, annualised utilisation stood at 62 percent.

Southeast Asia

North of Australia, Papua New Guinea's PNG LNG saw shipments decrease by 0.09mmt (-16 percent) to 0.46mmt in May compared to 0.55mmt in April. PNG LNG lost significant market share in Japan, which was only partially compensated by additional exports to Taiwan and China at the time of writing.



Source: LNG Journal

At 97 percent, however, the plant operated close to nameplate capacity, our calculations show.

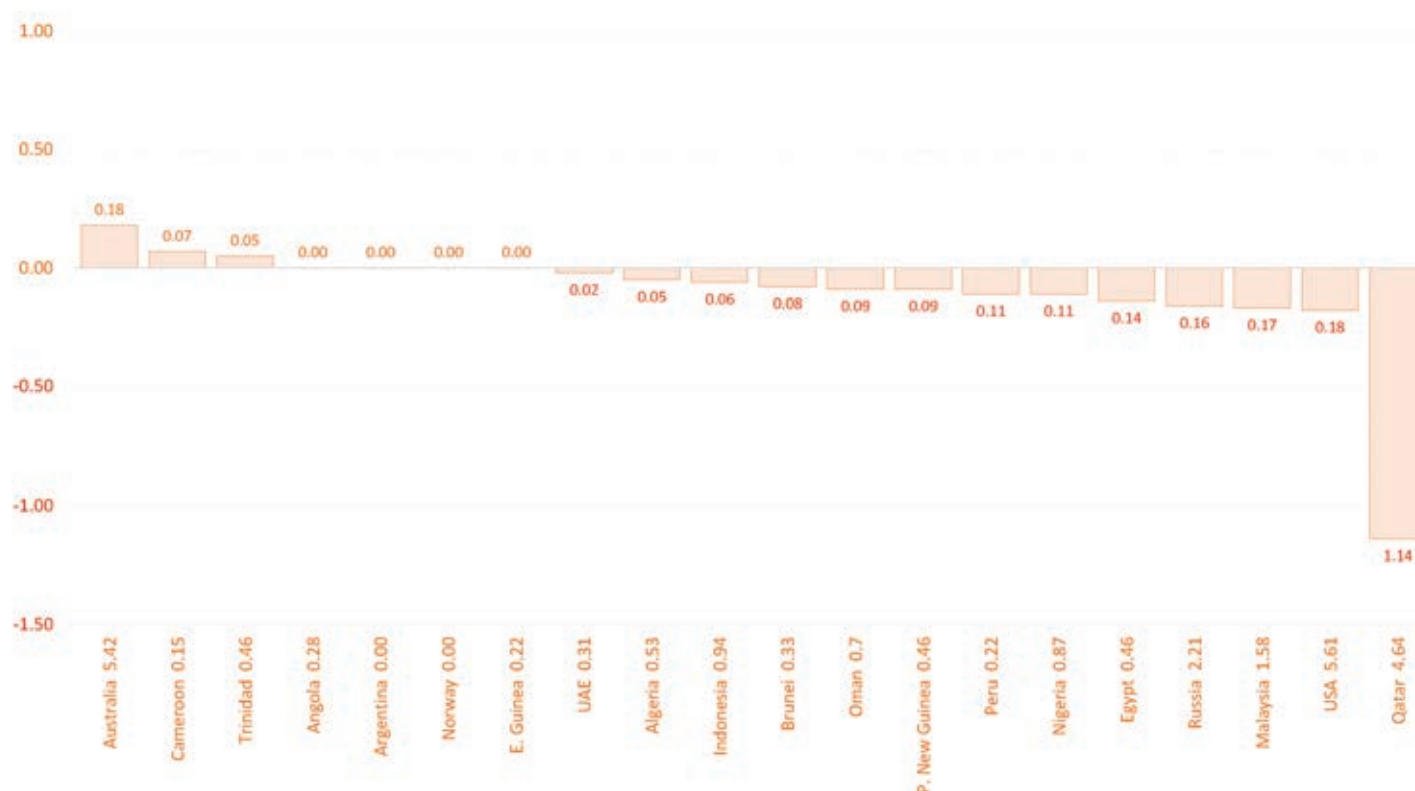
In neighbouring Indonesia, the amount of LNG shipped also trailed that recorded during its equivalent April period by 0.06mmt (-6 percent) from 1.00mmt to 0.94mmt in May. Only, the Donggi-Senoro plant had sustained output at 0.18mmt. The Tangguh LNG facility, meanwhile, had decreased shipped LNG volumes by 0.04mmt (-7 percent) from 0.53mmt to 0.49mmt. The Bontang plant had also reduced shipments by 0.02mmt (-7 percent) from 0.29mmt to 0.27mmt during the preliminary report period up to 25 May.

Malaysia saw a more significant decrease in monthly shipments, which was led by a 0.14mmt decrease at PFLNG Satu as the facility had not been seen in the market in May at the time of writing. Concurrently, Petronas' Bintulu LNG complex curtailed LNG output by 0.10mmt (-6 percent) to 1.51mmt. This reduction in volumes was only tempered by Petronas' PFLNG Dua FLNG facility returning to the market with a cargo loading of 0.07mmt after a market absence during the equivalent report period in April. Accordingly, Malaysian LNG shipments were down by 0.17mmt (-10 percent) to 1.58mmt at the time of writing from 1.75mmt for the equivalent period in April. Concurrently, Brunei had also decreased LNG exports by 0.08mmt (-19 percent) to 0.33mmt from 0.41mmt.

Russia & Peru

Elsewhere in the Pacific, Russia's Sakhalin-2 LNG equally shipped less LNG. The plant's exports amounted to

Incremental LNG Exports by Country (MMt)
As of 25 May 2022



Source: LNG Journal

0.71mmt in May at the time of writing, down by 0.10mmt (-12 percent) from 0.81mmt for the equivalent period in April. The plant's May performance to date was due to significantly less market share in China and Japan, which was only partially compensated by increased shipments to South Korea and Taiwan. Nevertheless, the plant continued to operate at above (adjusted) nameplate capacity, with 25-day utilisation pegged at 106 percent at the time of writing. Meanwhile, Peru's Pampa Melchorita trailed its April performance during the first 25 days by 0.11mmt (-33 percent) to 0.22mmt from 0.33mmt in April.

Atlantic Basin

In contrast to the Pacific, the Atlantic Basin's overall amount of shipped LNG at the time of writing broadly matched that during the first 25 days in April, showing only a marginal gap of 0.05mmt (-1 percent) period-on-period at 9.62mmt in May compared to 9.67mmt in April. This translated into annualised export capacity utilisation of 75 percent at the time of writing.

North Africa & Europe

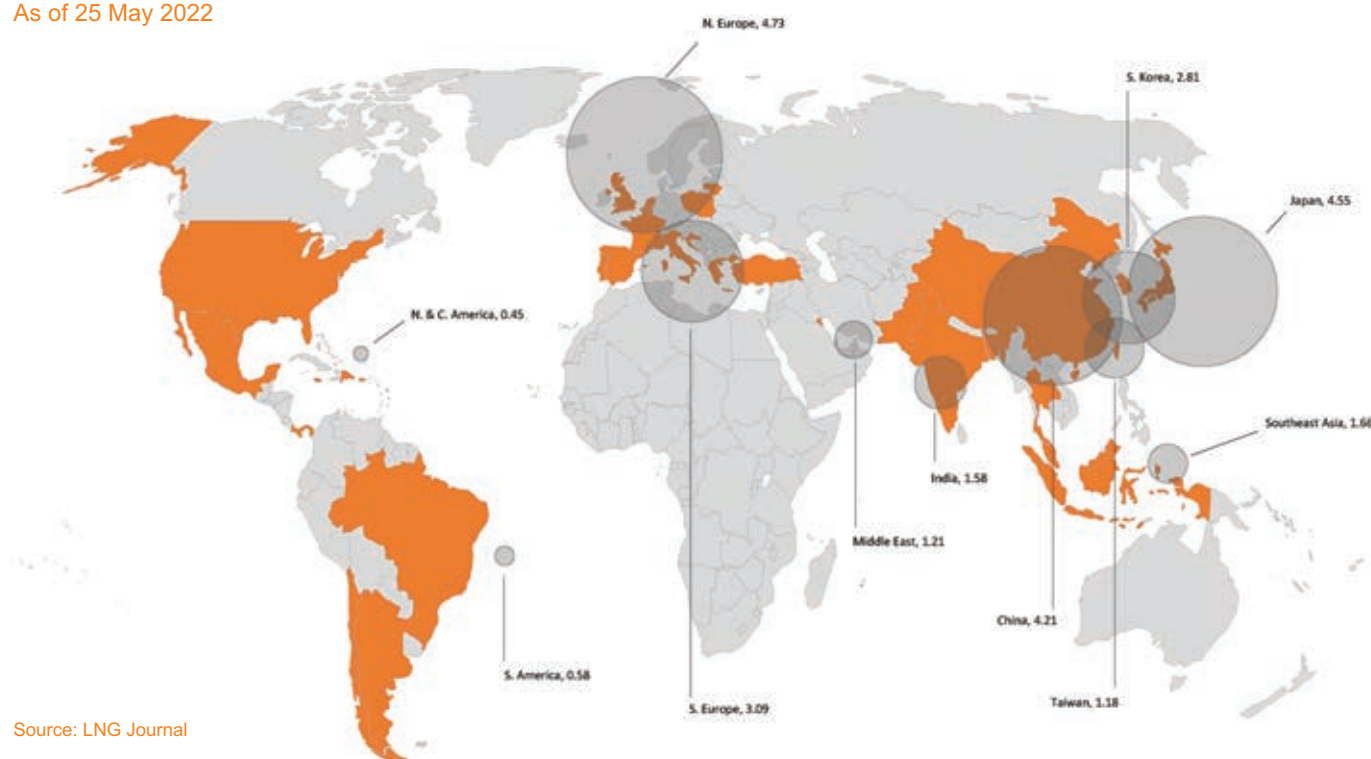
At 2.03mmt, the overall amount of LNG exported within the north-eastern part of the Atlantic Basin – comprising the European Union, Russia and North Africa

(and not including re-exports) – was trailing the 2.14mmt recorded during the equivalent period in April by 0.11mmt (-5 percent) at the time of writing. Notably, Snøhvit LNG in Norway had not yet resumed LNG shipments and thus continued to weigh on the eastern Atlantic's overall exports. Meanwhile, regional exports also suffered from a notable decrease of 0.05mmt (-9 percent) in Algeria at the time of writing on 25 May. Whilst Skikda had kept LNG exports steady at 0.19mmt, output from Arzew was down 0.05mmt (-13 percent) to 0.34mmt. Monthly shipments from Russia's Yamal LNG had also decreased by 0.06mmt (-4 percent) as an increase in exports to France could only partially compensate for fewer shipments to Spain, Belgium and the Far East at the time of writing.

West Africa

Meanwhile, West African exports were down slightly by 0.04mmt (-3 percent) as of 25 May. Nigeria had decreased shipments by 0.11mmt (-11 percent) to 0.87mmt from 0.98mmt in April. Elsewhere, West African exports remained steady in Angola and Equatorial Guinea, where we recorded exports of 0.28mmt and 0.22mmt, respectively. Accordingly, the region had only seen an increase in shipped LNG from Cameroon for the month at the time of writing. The country's FLNG facility had exported 0.15mmt by 25 May, up 0.08mmt (88 percent) over the amount

Global LNG Imports (MMt)
As of 25 May 2022



Source: LNG Journal

shipped by 25 April. West African exports were affected by a significant demand decrease in northern Europe and India.

Americas

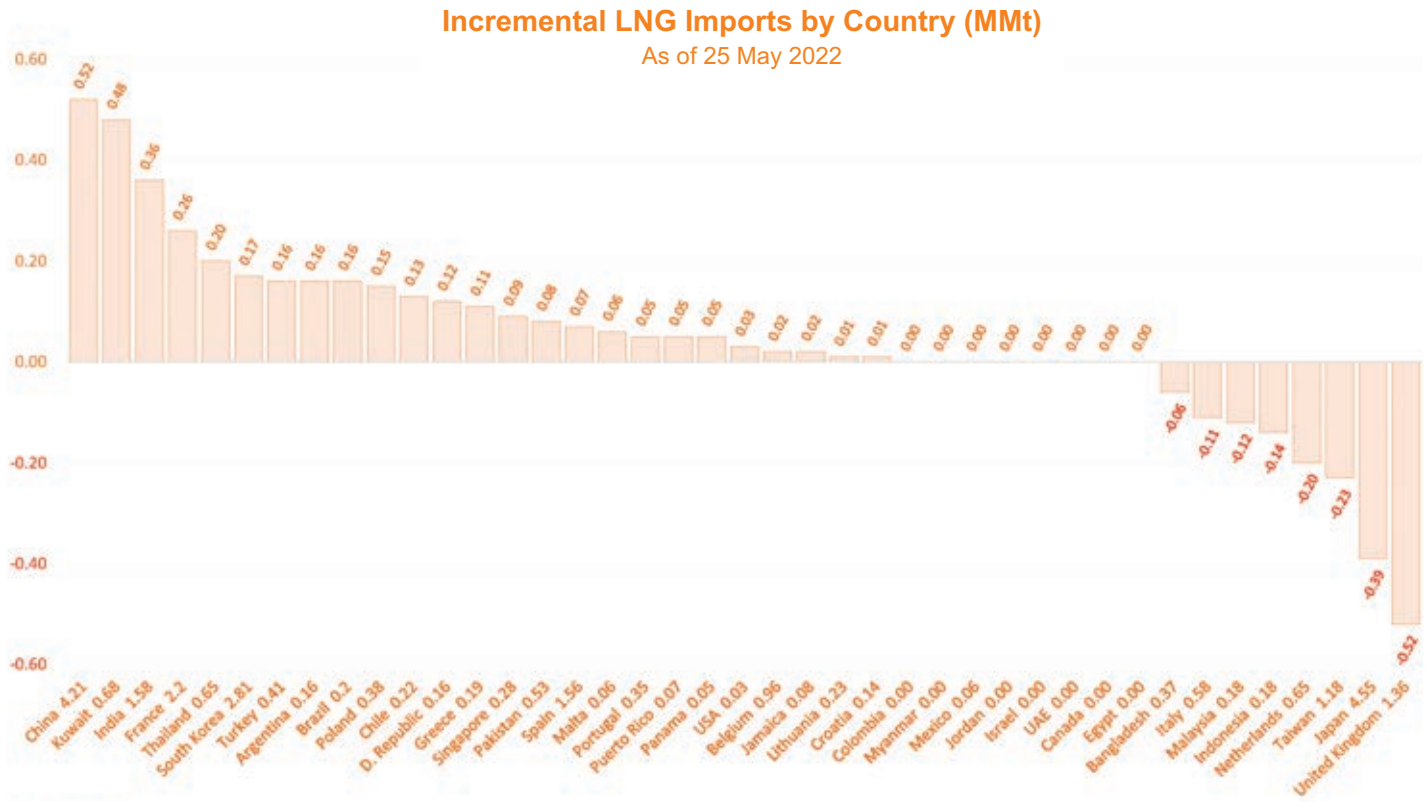
Exports from the US Gulf Coast saw a slight overall decrease of 0.18mmt (-3 percent) to 5.61mmt during the report period up to 25 May from 5.79mmt for the equivalent period in April. Our data indicated the export decrease was mainly due to considerably lower exports by 0.16mmt (-17 percent) to 0.76mmt at Cameron LNG and by 0.13mmt (-14 percent) to 0.80mmt at Corpus Christi LNG. Elba Island had also not yet been seen in the market as of 25 May, having exported 0.16mmt by this time in April. As such, a further export decrease of 0.07mmt (-3 percent) to 2.27mmt at Sabine Pass LNG meant export growth at Calcasieu Pass LNG, Cove Point LNG and Freeport LNG totalling 0.34mmt (24 percent) could not compensate.

In South America, Atlantic LNG in Trinidad & Tobago had seen exports increase by 0.05mmt (12 percent) to 0.46mmt at the time of writing up to 25 May compared to 0.41mmt for the equivalent period in April. Atlantic LNG shipments continued their focus on Europe and the Caribbean whilst decreasing shipments to North America maintaining steady exports to Asia.

Middle East

In contrast to only moderately subdued period-on-period Pacific and Atlantic Basin exports, shipments from Middle Eastern plants as of 25 May were trailing their April counterparts significantly. Exports were down sharply by 1.39mmt (-19 percent) from 7.50mmt on 25 April to 6.11mmt on 25 May. Accordingly, our data showed the Basin’s overall utilisation of operational export capacity (i.e., excluding Yemen) to stand at 84 percent at the time of writing (adjusted to 25 days of operation), down 4pp from 88 percent for the equivalent April period.

The negative export growth in the region was led by Qatar, which had curtailed exports by 1.14mmt (-20 percent) to 4.64mmt compared to 5.78mmt in April. Notably, the month-on-month curtailment was mainly due to significant negative growth in shipments to Asia, including India, China and South Korea. Exports to Asia were down by 1.26mmt (-36 percent). Although our data indicated there were still 0.46mmt of Qatari LNG volumes at sea broadly headed to destinations in the Far East,



Source: LNG Journal

these may change the overall weighting of destinations but not the total shipped amount. Concurrently, at 0.66mmt, European imports of Qatari gas were trailing their counterparts up to 25 April by 1.00mmt (-60 percent) at the time of writing, led by a 0.44mmt reduction in the United Kingdom. This only left the Middle East as a region with net import growth of Qatari LNG, whereby volumes were up by 0.08mmt (13 percent) to 0.69mmt. Exports to Kuwait had grown by 0.05mmt (31 percent) to 0.21mmt and shipments to Pakistan were up by 0.03mmt (7 percent) to 0.48mmt.

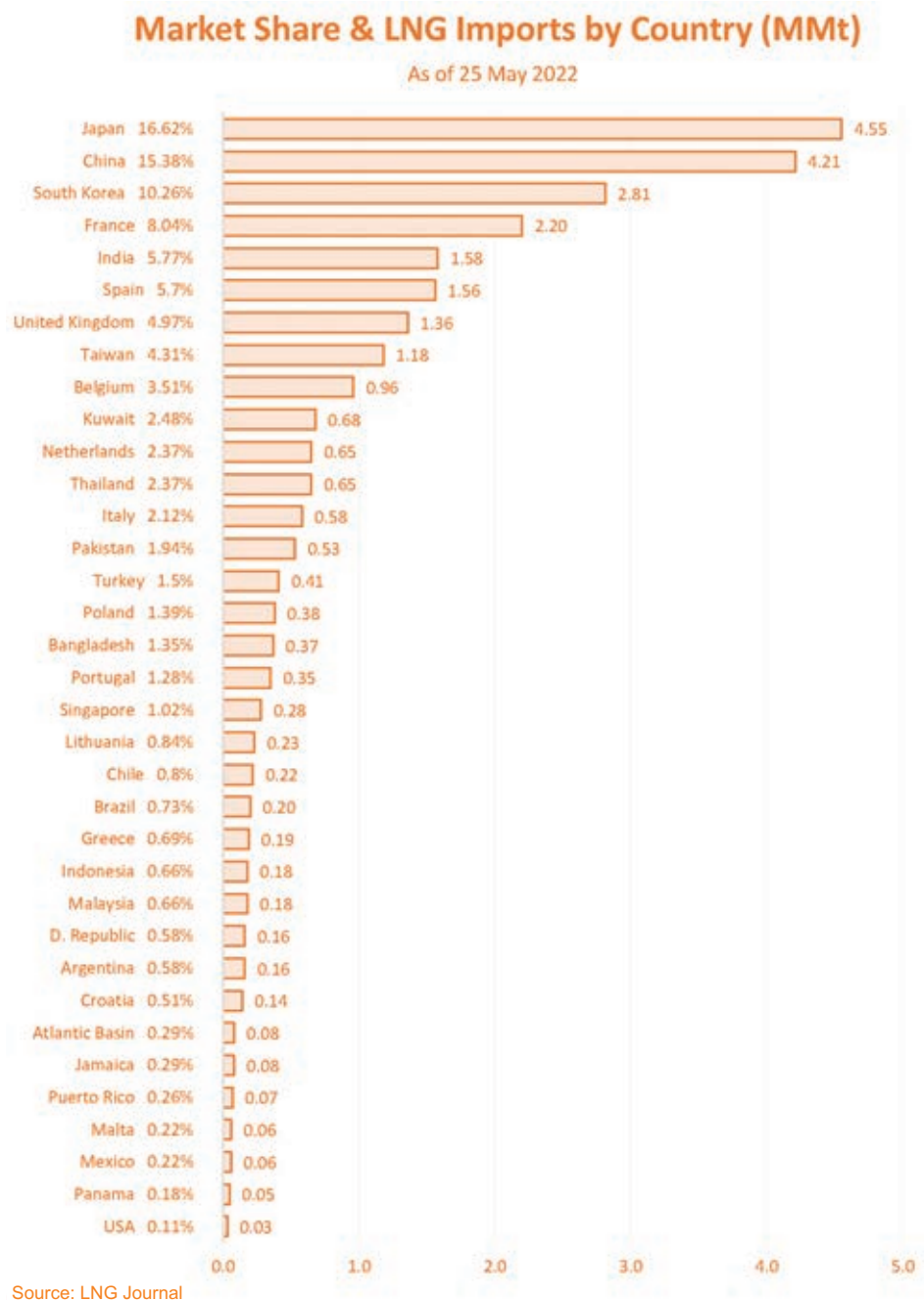
The country’s fellow Persian Gulf producers in Oman and the UAE had seen an overall export decrease by 0.11mmt (-10 percent) from 1.12mmt to 1.01mmt by the time of writing on 25 May. This reduction was led by Oman, which had decreased exports by 0.09mmt (-11 percent) to 0.70mmt from 0.79mmt. Meanwhile, the UAE’s Das Island plant had also reduced shipments by a more moderate 0.02mmt (-6 percent) to 0.25mmt from 0.31mmt. Similar to Qatar, the two Persian Gulf producers struggled to overcome trailing exports to Asia.

Egypt, meanwhile, had also seen shipped LNG volumes trail their April counterparts for the period to date on 25 May. Shipments by the country’s Idku LNG plant were down 0.08mmt. They thus had decreased by 26 percent from 0.31mmt to 0.23mmt. Neighbouring Damietta LNG, meanwhile, had reduced exports by 0.06mmt (-21 percent) to 0.23mmt from 0.29mmt. Overall, Egypt

had thus decreased exports by 0.14mmt (-23 percent) to 0.46mmt by the time of writing in May compared to the equivalent period in April.

Imports & Domestic Trade

Global LNG imports were up 1.83mmt (7 percent) for the period up to 25 May compared to their equivalent up to 25 April. Significantly higher imports in the



Source: LNG Journal

Atlantic Basin added to demand growth in the Pacific Basin and the Middle East.

Pacific Basin

Period-on-period Pacific Basin imports had increased slightly by 0.32mmt (2 percent) at the time of writing in May as China, India and South Korea had increased offtakes by 1.05mmt (14 percent) to 8.60mmt overall. This growth was, however, tempered by reductions elsewhere in the Pacific. Our data at the time of writing showed a significant overall period-on-period reduction of 0.88mmt (-13 percent) in Indonesia, Malaysia, Taiwan and Japan.

In line with the Pacific's net demand increase, the roster of smaller Pacific buyers in volume terms – including Bangladesh, Thailand, Chile, Mexico, Singapore and Myanmar – had collectively seen imports increase by 0.36mmt (30 percent) by the time of writing on 25 May. This was primarily due to Thailand boosting imports during the first 25 days of the month by 0.20mmt (44 percent) alongside an increase of 0.13mmt (144 percent) in Chile and 0.09mmt (47 percent) in Singapore. Mexico had also returned to the market with an import of 0.06mmt. Accordingly, net growth for this subset of importers was only tempered by a substantial decrease of 0.06mmt (-14 percent) in Bangladesh whilst we continued to see a lack of LNG demand in Myanmar.

Atlantic Basin

In line with the Pacific and the Middle East, LNG imports in the Atlantic Basin were up by 0.66mmt (7 percent) to 9.82mmt as of 25 May from 9.16mmt during the equivalent period in April, with capacity utilisation at 52 percent.

However, unlike this time in April, European demand was not a significant factor in the Basin's overall demand growth. Although several European importers – led by France, Turkey and Poland – collectively grew their imports by 0.90mmt (16 percent) to 6.56mmt, this was almost negated by demand curtailments totalling 0.83mmt (-24 percent) in Italy, the Netherlands and the United Kingdom. Accordingly, Europe saw only slight net demand growth of 0.07mmt in the first 25 days of May compared to its 25-day counterpart in April.

This left the bulk of period-on-period demand growth to the western Atlantic. Importers in the Caribbean and South America – including Brazil, Jamaica, Puerto Rico and the Dominican Republic

– saw net LNG demand jump by 0.56mmt (350 percent) to 0.72mmt at the time of writing in May from 0.16mmt during the equivalent period in April. Notably, Brazil had to share the position of top regional importer with Argentina in May, as both countries increased offtakes by 0.16mmt. Argentina had not taken in a cargo during the first 25 days of April whilst Brazil boosted offtakes to 0.20mmt (400 percent). At 0.24mmt overall, the month up to 25 May also saw double the demand in the Dominican Republic, Puerto Rico, Panama and Jamaica compared to the

first 25 days in April whilst Colombia resumed its market absence following a rare import of 0.06mmt in January, our data showed. Finally, LNG demand had also returned in the United States with an import of 0.03mmt in April, whilst Canada had not imported LNG in May at the time of writing.

Middle East

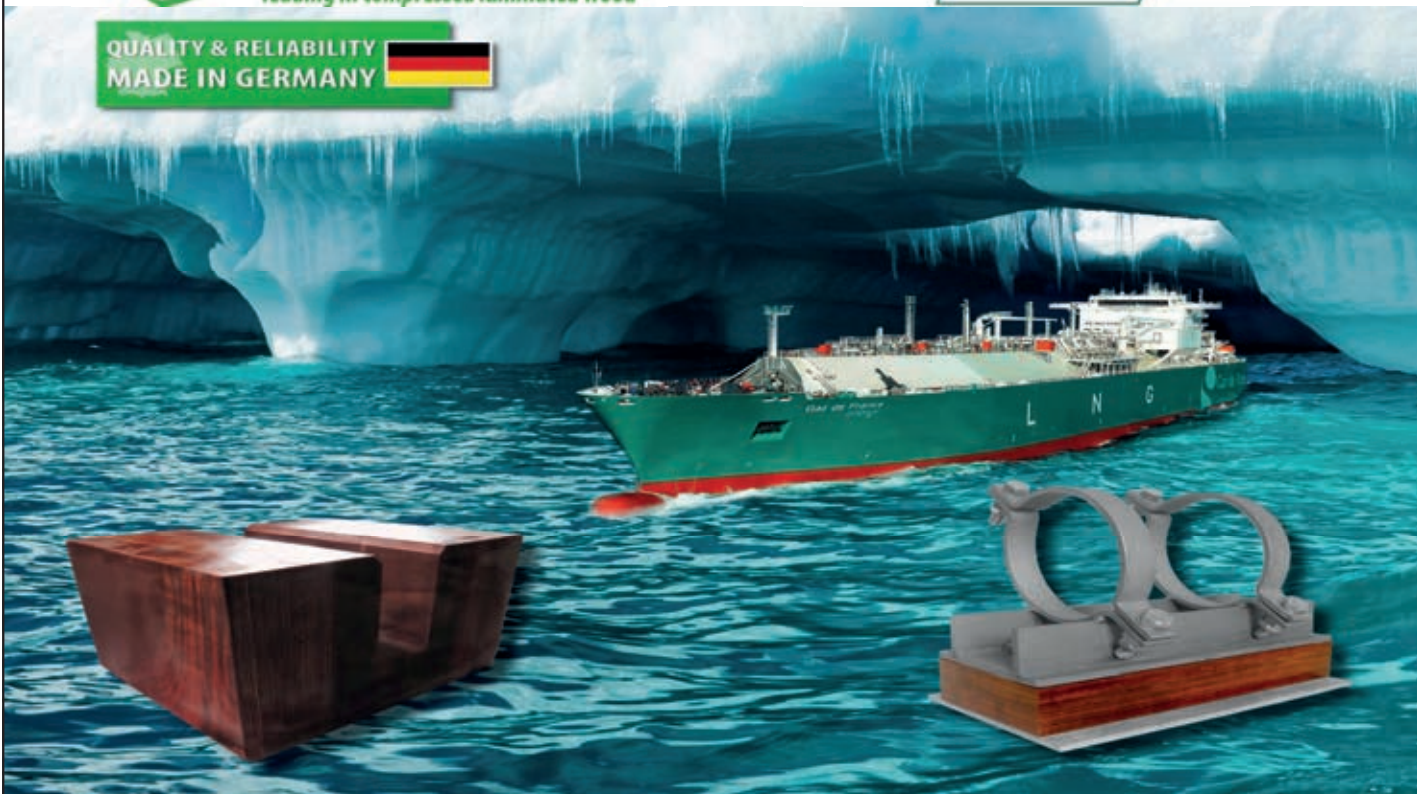
Concurrently, Middle Eastern LNG demand also received a boost during the first 25 days of May. Offtakes were up by 0.56mmt (86 percent) to 1.21mmt in May

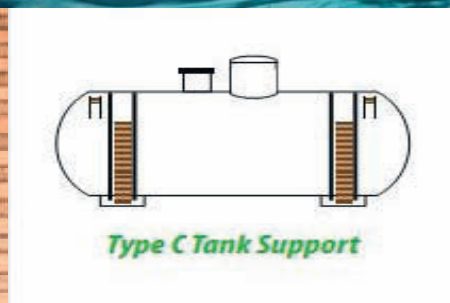
from 0.65mmt in April. Regional offtake figures benefitted from a strong rise in Kuwaiti LNG demand to 0.68mmt (240 percent) after the country took in 0.20mmt in the first 25 days of April. Meanwhile, demand at Pakistan's Port Qasim facility had increased more moderately by 0.08mmt (18 percent) at the time of writing. As was the case in April, Dubai's FSRU was not seen in the market, which also applied to Jordan's LNG terminal. Accordingly, the Middle East's annualised import capacity utilisation stood at 33 percent at the time of writing. ■



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LNGCs and the IMO's de-carbonisation window

DNV has revealed the results of a joint industry project (JIP), which studied an LNGC newbuilding concept to determine feasible approaches to achieving compliance with the IMO de-carbonisation path towards 2050. Technical Editor Ian Cochran reports.

The joint study, undertaken by DNV, TotalEnergies and Hyundai Heavy Industries (HHI), evaluated a current 174,000 cu m LNGC design to determine how it can meet the IMO CO₂ emission targets.

Its goal was to map a practicable path to enable the vessel to comply with the carbon reduction trajectories. In particular, the JIP aimed to identify the most cost-effective way to achieve compliance, identify the optimal time to implement a retrofit and to understand the uncertainties.

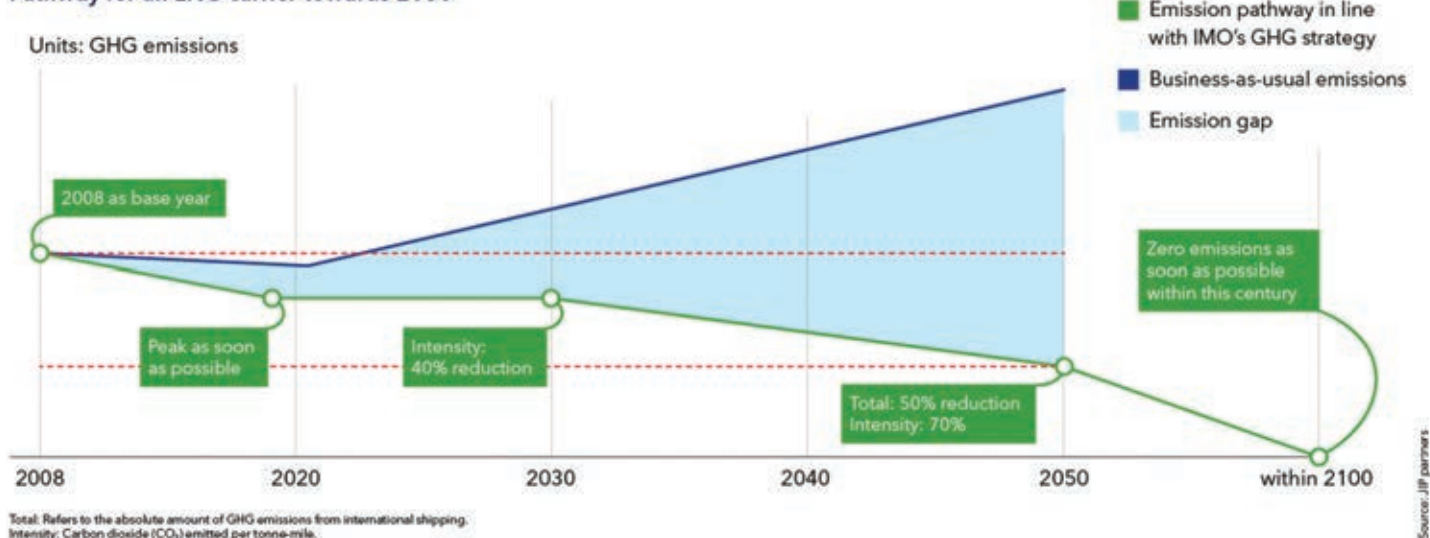
Different de-carbonisation options, including measures related to energy efficiency, energy harvesting, on board CCS and alternative fuels, were studied from a vessel lifetime perspective. Cost implications and safety were also considered.

The baseline vessel was a 174,000 cu m LNGC fitted with a low-pressure (X-DF) propulsion system and reliquefaction plant. As for energy-saving devices, the study vessel featured propeller boss cap fins and a rudder bulb, plus an air lubrication system and a shaft generator.

Two trade routes were analysed: Houston to Antwerp and Houston to Japan, as well as two operational profiles, normal trading speed and slow steaming. Typical annual operational data for the two routes, such as operational carbon intensity and annual fuel consumption, were used for reference.

The points in the graph below where the carbon intensity of the vessel, shown as horizontal lines for either operating profile, intersects with the de-carbonisation trajectories towards 2050 and 2040 show the latest possible time for retrofitting energy saving measures and

Pathway for an LNG carrier towards 2050



Source: DNV

carbon abatement technology and/or start using a blend of carbon neutral fuels so that the ship will continue to comply with emission limits.

For the 2050 trajectory, the critical year will be 2038 for operational profile 1, whereas for the more ambitious 2040 trajectory, the ship would have to be converted/use blended fuels by 2031. Assuming that the ship is commissioned in 2025, the second drydocking in 2035 will be the best opportunity for an upgrade in the first scenario. For the slow steaming operational profile (OP2), the third drydocking in 2040 would be sufficient.

Five measures to reduce carbon intensity were identified -

- On board carbon capture and storage.
- Fuel cells.
- Waste heat recovery.
- Shore power.
- Wind assistance- three Flettner rotors.

The benefits and economic feasibility of four different strategies were evaluated.

A: The LNGC operates as designed and built throughout its lifetime, blending in progressive amounts of bio/eLNG to

remain compliant from 2037 onwards.

B: The vessel equipped with three rotor sails (Flettner rotors), as well as shore power equipment from the day of delivery and begins to blend in bio/eLNG and bio/eMGO in 2038.

C: A carbon capture and storage (CCS) system is installed on board in 2035 to extract CO₂ emissions from the exhaust. A 100% CO₂ abatement potential (optimistic) is assumed, and therefore there is no need to blend in bio/e-fuel.

D: A modular fuel cell system and a waste heat recovery system are installed in 2035. In 2037, bio/eLNG and bio/eMGO are blended in progressively to achieve the target carbon intensity.

The three rotor sails are estimated to reduce fuel consumption and CO₂ emissions by almost 6% per year, based on historical trading patterns and wind conditions. Weather routing will further improve the benefit. Some crew training will be necessary.

Using shore power will further reduce

board, eg, an extra deck to accommodate the system and a CO₂ tank.

The extra fuel needed (almost 24%) to power the system will not affect the vessel's carbon footprint, which is considered to be zero after the retrofit. The feasibility of this strategy depends on the existence of onshore CO₂ infrastructure and value chain (still not in place).

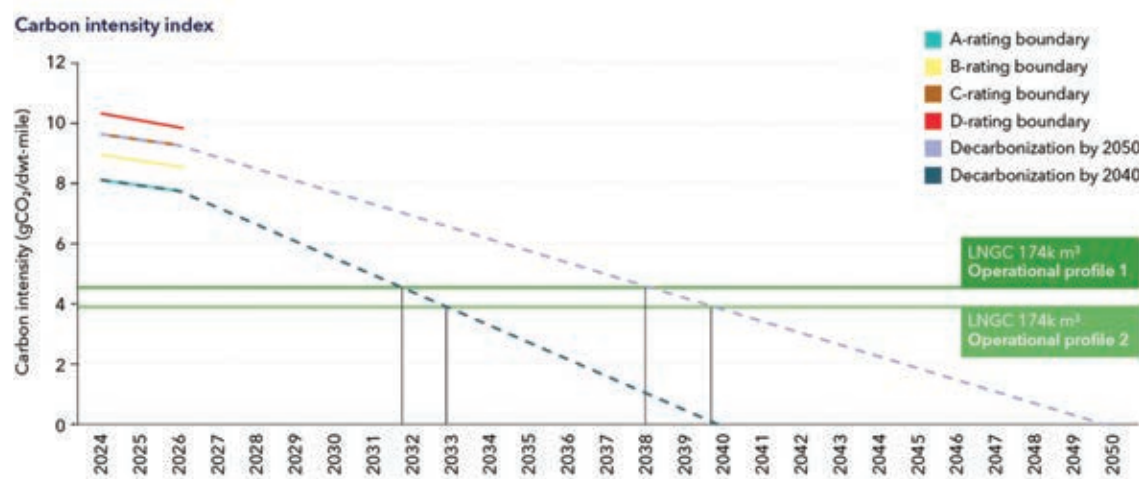
Modular solid oxide fuel cells (SOFC) running on LNG combined with a waste heat recovery system can provide auxiliary power and increase efficiency. The fuel cells and batteries need to be replaced after eight years. Fuel savings are estimated to be 6–7% and the CO₂ abatement potential is in the same range.

DNV's FuelPath model was applied to evaluate the economic performance of the design options, ie fuel and energy-efficiency strategies available to a specific ship. Based on varying assumptions and scenarios, this model assists shipowners in identifying design choices that will be resilient to future changes and perform well under a range of scenarios over the vessel's lifetime. The performance is expressed as total cost of ownership (TCO) and other economic parameters.

Since future fuel prices are hard to predict, the study accounted for three different fuel price scenarios (high, baseline and low).

Carbon intensity effect

The four strategies differ significantly in terms of carbon intensity (CII) after a retrofit. While the vessel being studied will be equipped with state-of-the-art efficiency-enhancing features enabling



Source: DNV



**DNV's Business Manager-
Gas Carriers and FSRUs
Martin Cartwright**

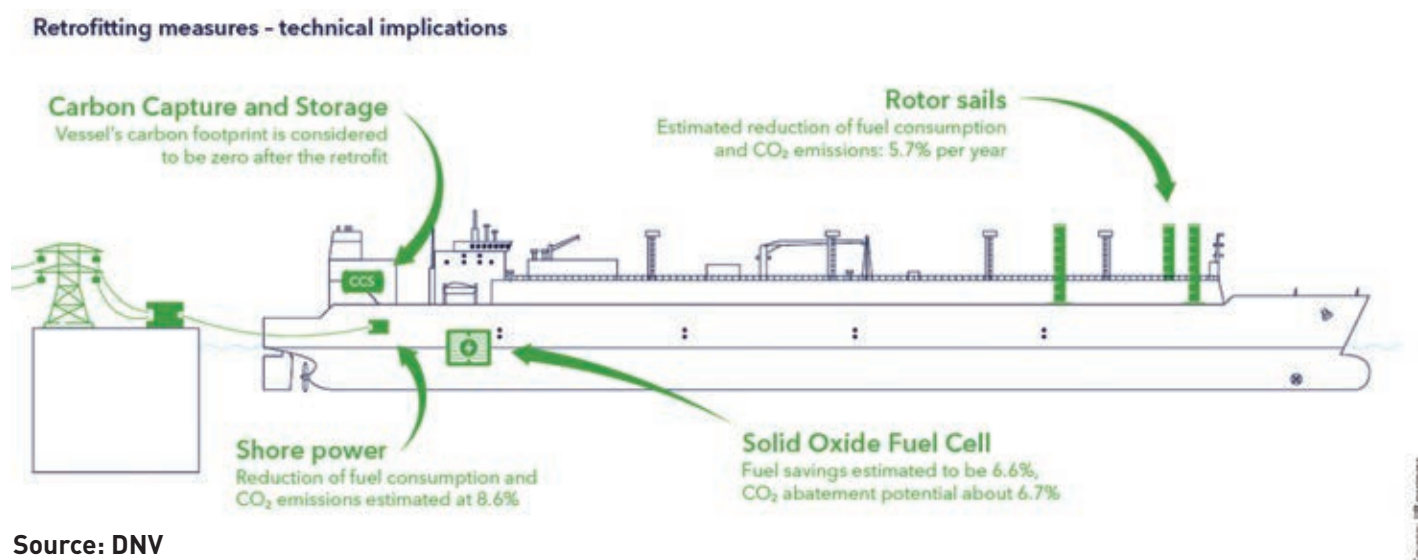
her carbon intensity performance to be significantly better than that of the current fleet average, any of the three other strategies will further improve its CII rating and reduce fuel costs.

Strategy B (rotor sail/shore power at the newbuilding stage) and to a lesser extent, Strategy D (fuel cell/waste heat recovery retrofit) will both delay when it will be necessary to blend in carbon-neutral fuel. Strategy C (carbon capture) reduces the CII to zero, which offsets the fact that it causes fuel consumption to increase.

Annual costs development— assuming the middle or 'baseline' fuel price scenario – reflects the investments in the newbuilding and subsequent retrofits, as well as the resulting fuel costs.

In the case of Strategy A, fuel costs rise steeply when carbon-neutral fuel is added progressively as of 2037. The rotor sails and shore power mitigate this effect for Strategy B. While Strategy C must invest a substantial amount in the CCS system in 2035. This investment will keep fuel costs constant during the remaining years. Strategy D ends up with the highest overall bill because of the investment in fuel cells; the fuel savings cannot compensate for this, DNV said.

In general, Strategies B and C show



Source: DNV

the lowest TCO throughout the vessel's lifetime. This conclusion may change, however, if a CO2 tax is introduced or a more ambitious target greenhouse gas intensity trajectory (eg, to de-carbonise by 2040) is applied. Strategy C is least sensitive to the different fuel price assumptions applied in this study, as it does not utilise carbon-neutral fuels.

Strategy A's TCO is found to have the greatest sensitivity to fuel prices because of its reliance on carbon-neutral fuels and relatively high energy consumption compared to Strategies B and D (after 2035).

The best option in terms of TCO is the wind-assisted propulsion combined with shore power, closely followed by the CCS approach (base and low cases). In an accelerated scenario (de-carbonise by 2040), the additional carbon-abatement measures must be taken at an earlier time.

Carbon tax

A future CO2 price will have a significant effect on the cost scenarios by 'punishing' the solutions with the highest fuel consumption. This should be taken into consideration when selecting the carbon reduction strategy for a newbuilding.

The JIP accounted for this, assuming a carbon tax scenario believed by industry stakeholders to be realistic. The impact from the carbon tax is not shown here, but

for Strategy A (baseline), for example, a carbon tax will increase the TCO by around 20%. Strategy C (CCS) performs relatively better when a CO2 tax is introduced.

It is important to bear in mind the uncertainties affecting the study, in particular fuel price developments, fuel taxation, fuel availability in the relevant trading area, the regulatory decarbonisation trajectory that will be applied, and the shipowner's own decarbonisation ambitions, DNV stressed.

Also carried out was an overall design and safety review. For example, rotor sails, which is a mature technology, require free wind inflow to maximise the forward thrust of the Magnus effect. Their arrangement on deck must account for factors, such as rudder action, ship turning ability, cargo-deck operations, line of sight from the bridge and structural strengthening for the sail foundations. Some crew training is required and relevant safety rules must be taken into consideration.

To use shore power, appropriate electrical installations are required on board and a range of considerations should be assessed, eg location of equipment relative to hazardous zones, emergency departure, switchboard arrangements, etc.

CCS technology is expected to reach maturity within the next five years.

requires extra power generation and port infrastructure to collect the captured CO2.

A fuel cell system is modular and containerised, requiring a safe space, an exhaust for the waste heat recovery system, as well as access to fresh air and fuel. If this approach is chosen, it should be accounted for in the engine room and funnel design, as well as some deck reinforcements. Fuel and electricity hazards and crew training are additional criteria.

There is a way towards 2050, but the 'right' direction is very ship- and trade-specific, and a range of assumptions need to be established, DNV said.

Conclusions

The LNGC studied is expected to be well-aligned with the IMO ambition to de-carbonise shipping fully by 2050. A more ambitious target can be met by taking appropriate measures earlier. The study concluded that for the fuel price scenarios, CO2 pricing and timeline scenarios considered, Strategies B (rotor sail, shore power) and C (CCS) result in the lowest TCO.

Surprisingly, Strategy C is the most robust under these assumptions, provided it achieves a 100% carbon abatement rate and an appropriate CO2 onshore infrastructure is established. Strategy B has the lowest energy and drop-in fuel demand, provided shore power is available at all of the ports of call.

Strategies A, B and D's calculations are contingent upon the availability of carbon-neutral LNG and MGO at relevant bunkering ports.

An unequivocal recommendation for any particular fuel or carbon abatement technology cannot be made, considering the uncertainties involved. Rather, the JIP illustrates a structured process that will help owners keep a range of options open as the shipping world steers towards de-carbonisation, DNV concluded. ■

Annual and accumulated costs for baseline price scenario (decarb by 2050)



Source: DNV

Gasification offers potential for LNG fuelling networks

New gasification technology offers the potential to strengthen LNG fuelling networks worldwide and deliver 100 percent carbon neutral fuel for future fleets over the next decade, our Fuelling Editor Malcolm Ramsay reports

Long plagued by concerns over viability, with several high-profile project failures in the early 2000s, the gasification sector now faces a crucial inflection point as new technology offers the potential to deliver new levels of flexibility and convert waste into energy on unprecedented scale.

“The versatility of our technology both in terms of scale and variety of feedstock is such, that plants can be tailored to the local availability of specific feedstocks and be changed in case availability changes, making easier to secure the necessary feedstock and enabling a stable business. We are also able to focus primarily on feedstocks from waste streams,” David Palumbo, CEO of EQTEC, a global firm specialising in producing a pure syngas from its gasification technology, tells *LNG Journal*.

Energy from waste

Gasification is the complete thermal breakdown of biomass particles into synthesis gas (syngas), volatiles and ash in an enclosed reactor. This process not only generates energy from waste but through methanation the output gas can be further transformed to bioLNG.

In the fourth quarter last year, shipping line CMA CGM and French energy company Engie announced a new partnership to focus on production and distribution of synthetic methane and BioLNG at the Port of Marseille. The collaboration is expected to study pyro-gasification and methanation, using green hydrogen and captured CO₂, to

develop fuels for use by the shipping industry.

“CMA CGM and ENGIE have decided to establish a long-term strategic and industrial cooperation focused on the production of decarbonized fuels. The cooperation has the ambition to support the development of a synthetic methane production and distribution industry that can be used by the shipping sector,” a spokesperson for Engie said.

The latest gasification technology allows operators to turn an ever-wider scope of feedstocks into high-quality gas, with inputs ranging from olive stones and nutshells to contaminated plastic and municipal waste. Palumbo highlights that EQTEC’s Advanced Gasification Technology has been proven to convert almost 60 types of waste, providing a ‘highly agile solution’ that can be applied in different regions and countries to meet different, local needs.

The adaptability of the latest technology not only means that there are more opportunities to secure feedstocks but also that the end product can be better tuned, potentially adjusting chemical composition of the LNG, or even producing new fuels, to accommodate different vehicle or vessel types.

“Syngas is primarily CO+CH₄+H₂: If you have high quality syngas such as ours, and are able to control the components ratios, then extracting hydrogen through water gas shift or SNG by methanation is achievable with attractive commercials,” Palumbo notes.

With many governments around the



LNG refuelling station

world now facing difficult choices to meet Net Zero targets, the ever-increasing volumes of municipal waste generated in most developed countries is also driving renewed interest in the technology to deliver clean energy.

“Demand is already high and growing fast in most regions. Regions leading with supportive government policy are the EU, UK, US whilst regions with strong demographic and economic growth such as with Asia are expected to lead on demand in the next few years,” Palumbo adds. “Many corporations in the LNG supply chain are investing heavily in transitioning away from conventional LPG to renewable alternatives as BioSNG or bioLPG.”

With transport networks, by their nature, spread out geographically the demand for LNG filling or bunkering stations is often in remote locations. The ability to produce small-scale gasification plants close to demand and operate these on a variety of feedstocks therefore offers benefits for LNG-fuelled fleets that might otherwise struggle to access supplies.

Improved energy security

Another key driver for gasification technology this decade is the growing need for energy security at the national and regional level. With the invasion of Ukraine highlighting the perilousness of natural gas supplies in Europe, and price spikes impacting markets around the world, the need for local, sustainable supplies is more important than ever.

“With a strong focus on energy security, the creation of resilient local production networks is critical to avoid

dependency on imports from countries with vast natural fossil fuel resources, particularly when geopolitical risks are present,” Palumbo comments. “The current high price of fossil fuels is narrowing the price gap and, in some cases, gasification is becoming even more cost effective, green and secure.”

Europe has in recent months announced massive investment in new LNG import terminals to ensure that the continent will have capacity should traditional pipeline flows cease but these can take years to build. Large-scale import via central hubs also poses difficulty for onward transmission where demand centres may change or are distant from import points.

“It’s a huge rush,” Simon Dekeyrel, energy analyst at Brussels-based thinktank the European Policy Centre, notes. “What we’re seeing right now is a flurry of new announced projects across EU member states.... which might really lead to unnecessary investments in fossil fuel infrastructure which would be much better spent elsewhere.”

An advantage of gasification is the relatively small-scale and modular nature of the technology, which allows plants to be constructed rapidly and close to existing industrial or transport infrastructure.

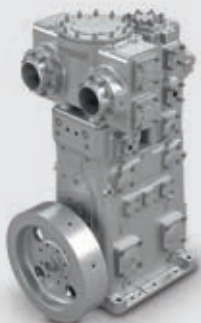
“Climate technologies are highly interdependent; competing in these interdependent markets requires cooperation across value chains and industrial ecosystems; and powerful first-mover advantages can be gained through risk taking and bold action,” Palumbo concludes. ■



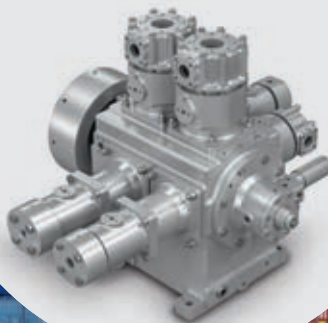
Gasification plant

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For the Record

BAKER HUGHES, the liquefied natural gas equipment-maker and energy services company, has told investors it was well positioned to capitalize on multi-year growth in LNG and new energy projects.

The company, which has main offices in Houston and London and is led by Chairman and Chief Executive Lorenzo Simonelli said it had an “exciting portfolio” of emerging energy transition technologies and solutions.

In its most recent earnings, Baker Hughes recorded strong orders from its Turbomachinery and Process Solutions (TPS) division and said the LNG order cycle continued to unfold.

The company believes that the industry has entered another constructive LNG cycle, which is being expedited by the current geopolitical situation, particularly for US LNG projects and it forecast that global liquefaction capacity could be expected to almost double by 2040.

“We have compelling growth profile driven by range of energy transition initiatives,” said Baker Hughes in a presentation to investors.

“Multiple areas could drive extended growth cycles over the next 5-10 years and beyond,” stated Baker Hughes.

Baker Hughes was most recently awarded the contract for the LNG driver system for the first phase of US company Venture Global’s Plaquemines LNG project, located south of New Orleans on the Mississippi River in Louisiana.

The company said it now had orders booked for 150 million tonnes per annum of LNG capacity.

Baker Hughes has four divisions and in addition to LNG equipment through the Turbomachinery and Process unit it also offers oil field services, oil field equipment and digital energy solutions.

“Gas fundamentals, particularly in Europe and Asia have tightened significantly. The current backdrop supports a new wave of LNG projects being sanctioned to fill the liquefaction capacity supply-demand gap,” it said,.

“there has also been a significant increase in long-term contracting activity and this has helped projects secure

funding and progress to final investment decisions,” it noted.

In oil services, the company stated that sustained underinvestment had started to impact supply in the oil market.

“Capital discipline and the escalating focus on shareholder returns has restrained spending and ESG pressures have driven the strategies of major international oil companies away from fossil fuels,” said Baker Hughes.

It cited in particular the members of the Organization of Petroleum Exporting Countries.

“OPEC countries, struggling to meet quotas, have seen spare capacity shrinking and global oil inventories trending significantly below average,” said Baker Hughes.

The company stated that the demand recovery in oil and LNG is set to exceed pre-Covid-19 levels despite increasing pressure to reduce hydrocarbon consumption.

Baker Hughes said the spending surge was fuelled by strong economic recovery in developed economies and long-term structural growth in emerging economies.

BURCKHARDT Compression, the Swiss-based specialist provider of LNG sector equipment and technology, said its Chinese subsidiary, Shenyang Yuanda Compressor Co., has signed a contract with China’s Sinopec Guangzhou Engineering to supply three skid-mounted hydrogen compressors for a major project.

Burckhardt said the equipment was for the Sinopec Xinjiang KuChe green hydrogen project.

The Chinese say the green hydrogen project has a total investment of almost 3 billion Chinese yuan (\$450M) and is the world’s largest such project under construction to produce green hydrogen from solar photovoltaic power generation.

“It consists of five major parts: photovoltaic power generation, power transmission, hydrogen production from water electrolysis, hydrogen storage and hydrogen transmission,” explained the Swiss company.

“The project will produce 20,000 tons of green hydrogen per year with a hydrogen purity of more than 99.9 percent,” it added.

“The hydrogen produced by water electrolysis will be pressurized to 32 bar by compressors and transported via pipeline,” stated Burckhardt.

One of Burckhardt’s key new products in the LNG shipping sector is its Laby GI Compressor type LP250, the world’s first

oil-free reciprocating high-pressure fuel-gas compressor in service.

Burckhardt’s fuel-gas compressor system plays an important role on LNG carriers to help maximise fuel efficiency.

In addition to its Swiss operations, Winterthur-headquartered Burckhardt has expanded in recent years to run businesses in the US, Japan and China and that’s why it owns Shenyang Yuanda Compressor.

Burckhardt said its high performance skid-mounted compressors are ideally suited to large green hydrogen projects and are capable of boosting pipeline transfers.

“With highly efficient frame, the whole machine is half the size of a conventional low-speed reciprocating compressor with the same capacity,” explained Burckhardt.

“Fully balanced moving parts eliminate compressor vibrations and improve operational reliability. The skid-mounted design enables easy on-site installation and shortens the project construction time,” it stated.

Burckhardt explained that according to the process requirements, the compressor needs to withstand pressure variations of approximately seven times the inlet pressure while guaranteeing a stable outlet pressure.

“It also needs to be optimized in terms of energy consumption. This places high demands on the compressor and control logic design, which will rely on Burckhardt Compression’s extensive technology and experience to provide customers with excellent solutions,” it said.

Green hydrogen is hydrogen produced by splitting water by electrolysis. This produces only hydrogen and oxygen.

You can then use the hydrogen and vent the oxygen to the atmosphere with no negative impact. To achieve the electrolysis, however, you need electricity.

The basic understanding of hydrogen is as an energy carrier and there are semantics behind its various names.

One has to make the distinction of hydrogen as a carrier and not an energy source.

What this means is that it needs a primary source of energy to be produced, either solar electricity as is the case in the Burckhardt project or hydro-power, nuclear power or gas-fired power to name just a few.

It should be noted that it is specifics of the production process, including the energy source it utilises, that determine whether hydrogen will be named green or blue.

Green hydrogen is hydrogen produced by splitting water by electrolysis as explained above.

Blue hydrogen is when natural gas is split into hydrogen and carbon-dioxide either by Steam Methane Reforming or Auto Thermal Reforming but the carbon-dioxide is captured and then stored.

CHART INDUSTRIES Inc., the liquefied natural gas equipment-maker and industrial gas technology company, reported first-quarter 2022 all-time record orders of \$636.8 million, its fourth record-order quarter out of the past five quarters.

Chart said the latest orders contributed to the Atlanta, Georgia-based company’s sixth consecutive record backlog quarter of \$1.47 billion.

The company’s first-quarter orders included \$228.4M of “Big LNG” export terminal releases.

“First quarter 2022 sales of \$354.1 million were our highest first quarter sales in our history and increased 22.7 percent when compared to the first quarter of 2021, an increase of 27.0 percent excluding Big LNG in both periods,” explained Chart.

Chart’s quarterly net income came to \$10.2M versus \$25.6M in the first three months of 2021 and \$12.1M in the final quarter of 2021.

“First quarter reported gross margin as a percent of sales of 23.6 percent was the highest in a year and in-line with the expected trend of increasing sequential gross margin and operating income as a percent of sales improvement for the remainder of 2022,” Chart added.

It explained that “energy independence, resiliency, security and sustainability” are the key drivers of record orders amid accelerating activity in both LNG and Specialty Products.

Chart said that in addition to the broad-based demand exiting 2021 and to start 2022, demand for its products, in particular LNG and other energy alternative solutions and equipment, accelerated as the result of the Russia-Ukraine conflict that began February 24, 2022.

“We have seen an increase in actual orders as well as inquiries from both public and private sector entities surrounding the need for infrastructure to access molecules to support energy security, access, independence and resiliency, all with the backdrop of the requirement for alternative sources of supply and continued focus on sustainability,” it added.

Chart explained that specific examples

of new orders received reflecting the acceleration of energy activity following the initiation of the Ukraine-Russia conflict include Chart's "three pillars" of its LNG business: Big LNG export terminals; small-scale LNG (ssLNG) and LNG infrastructure.

Chart's three "Big LNG" project orders in the first quarter included a \$135.5M order with Full Notice to Proceed (FNTP) brazed aluminum heat-exchanger assemblies and corresponding cold boxes for Venture Global Plaquemines Phase 1 with 10 million tonnes per annum of capacity.

Another \$47.5M order came in the Limited Notice to Proceed (LNTP) for Houston, Texas-based Cheniere Energy's Corpus Christi expansion. "We anticipate this project moves to FNTP in 2022," added Chart.

The third order amounted to \$45.4M for six of the 18 BAHX assemblies and cold boxes for Venture Global's Plaquemines Phase II export terminal project.

Chart added that the trend of small-scale LNG expansion continued in the quarter with the order from New Fortress Energy (NFE) for their "FastLNG2" project.

"Continuing this trend into the second quarter 2022 was our receipt of a Letter of Intent from NFE for FastLNG3," explained Chart.

Chart explained that Shell had also publicly announced its intent to build LNG fuelling stations for long-haul transportation in India.

"We have continued to see global LNG station demand including 14 stations booked in the first quarter 2022, three of which were with an international oil company," said Chart.

The company noted that while not in its guidance, it continued to expect additional progress from other LNG export terminal operators towards final investment decisions.

"We are pleased with our pricing and cost reduction progress, reflected in our improving gross margin as a percent of sales and expected to continue throughout the remainder of the year," stated Jill Evanko, Chart's President and Chief Executive.

"In addition, we continue to hit key milestones of one-year acquisition integrations on schedule while completing capacity and productivity projects throughout 2021 and 2022," added the CEO.

"These activities also support our ability to deliver our solutions on-time to

our customers as we continue to see record demand, including the first quarter of 2022 being our sixth consecutive quarter of setting a new historical backlog record and our highest order quarter ever," declared Evanko.

Chart added that Specialty Products orders continued to demonstrate consistency and strength, with the first quarter being the fifth consecutive quarter of Specialty Products orders above \$100M.

The company said it was also seeing numerous synergy sales opportunities across our "Nexus of Clean" newly acquired companies, ranging from cross-selling water treatment solutions to food and beverage customers to cross selling carbon capture processes to water customers.

"We are partnering with Simmons Foods for our third installation at the state-of-the-art industrial wastewater treatment site and processing facility in Southwest City, Missouri, by providing super-oxygenation technology for their efficient wastewater treatment," said Chart by way of an example.

"We are working with International Flavors & Fragrances in a unique application for odor reduction and efficient wastewater treatment at the Jacksonville, Florida, flavor and fragrances site," it said.

"This same customer is doing an engineering study with our Sustainable Energy Solutions' (SES) cryogenic carbon-capture technology," it added.

Chart said its Gas-By-Rail, carbon capture and space exploration orders each grew over 20 percent when compared to the first quarter of 2021, while water treatment grew over 500 percent.

ENBRIDGE Inc., the Canada-based North American natural gas and oil pipeline company, said it was securing more US LNG feed-gas supply contracts but also expects Western Canada to help fill the Asian supply and for a smoother pathway to the Gulf Coast for the huge Canadian oil resources.

Enbridge Chief Executive Al Monaco commented extensively on US and Canadian LNG and oil during a conference call on Calgary, Alberta-based Enbridge's recent earnings report.

"LNG Canada is in construction, of course, and Woodfibre LNG is advancing early stage construction activity. We are the main hardwood of the Montney and Deep Basin. So all of this bodes well for upstream expansion on our BC pipeline system," explained Monaco.

He stated that Asian markets as well as Europe are currently seeking long-term supply, the biggest opportunity, in Enbridge's view, is natural gas exports with the potential for over 30 billion cubic feet per day.

"That's more than tripled last year and of course, crude oil exports are set to grow by 50 percent," the CEO said.

"All of this is very positive for infrastructure pointed at tidewater," stated Monaco.

"Remember as well that the North American grid is integrated. So growing global demand and exports is upside to Canada and the US. What you see here is underpinned by strong energy demand," he added.

The Enbridge CEO said it was "not pretty" for US Northeast consumers having to pay natural gas prices at roughly five times the US benchmark Henry Hub.

"This situation screams for more infrastructure, especially given increased supply variability from offshore wind that's coming and more displacement of coal, of course," said Monaco.

"We put Phase 1 of our Appalachian-to-Market project into service last year and Phase 2 is in pre-construction," he added.

"Building greenfield is tough sledding, of course, these days, but these expansions are executable and cost-effective and there's more that we can do," Monaco told analysts.

"LNG exports is a big opportunity with momentum building across the US Gulf and now more so in Western Canada. Our Texas East system feeds LNG along the Gulf Coast," he noted.

He said Enbridge currently supplied four US LNG export plants with about 2 Bcf per day.

"We've locked up capacity agreements with three more LNG projects that could add up to 7 Bcf a day and over \$2 billion of new investments," he explained.

"Plaquemines LNG is now fully contracted and likely going ahead, which will drive \$400 million on our Venice extension project, not in the secured category yet, but we expect it to be shortly. Texas LNG and Rio Grande LNG are also progressing," said the CEO.

Shifting fundamentals are bringing Western Canada to the forefront once again.

"You've got a world-class liquids-rich resource base that rivals the Marcellus and the Haynesville," stated Monaco.

"And operators have done a every business a good job unlocking reserves.

We could see production grow 50 percent for LNG exports here and regional demand growth," he added.

Monaco declared that the North American "energy advantage" is even more evident today with massive low-cost reserves and the technology to produce them with the lowest carbon intensity.

He said it was also clear that natural gas and oil will be essential to meeting demand growth.

Canada's Trans Mountain Pipeline expansion (TMX) has reportedly reached a major landmark by passing its halfway mark to completion.

The project is intended to roughly triple the pipeline's capacity to 890,000 barrels per day on the 690-mile route across Alberta and British Columbia.

While pipeline hurdles increased along with costs it was noted the progress has been made.

The original line was completed in 32 months, from incorporation with a federal charter to its first delivery in 1953.

In contrast, TMX started work 15 years ago with its first leg built between 2007-2008 across the Rocky Mountains and to the Alberta-BC boundary. The completion target date has now been delayed yet again until 2023.

Since first approved in 2016, TMX costs have risen from C\$7.4 billion (\$5.9Bln) to C\$21.4Bln (\$17Bln) in 2022.

Commenting on getting the Western Canada Sedimentary Basin's vast oil and liquids reserves to market, CEO Monaco pointed to the TMX as a means of transportation.

"The fundamentals here for the oil sands basin and the basin generally in Western Canada are pretty positive," said Monaco.

"The mainline tolling agreement actually will be important in that we need to see clarity on the commercial underpinning for those projects that we have in the queue here," he added.

"In the bigger picture, if you think about it, we've got what would be two nice pathways through to the Gulf Coast, and that will continue to be an extremely strong market," he said.

"The thing that's happened recently here in terms of the security buffer that we've been talking about is the export position that we have relative to those two paths, I think it's going to be ideal in terms of the longer-term future of heavy oil coming out of Western Canada," he predicted.

"We know that the Gulf Coast is a great destination for that and will

continue to be. But now we've got this additional opportunity to really generate greater exports out of that region, too. So that bodes well for us, I think," the CEO concluded.

EXMAR, the Belgian shipping company, reported modest earnings though expects company finances to improve after a charter deal for its LNG storage and regasification unit (FSRU) barge to be the new Dutch LNG import terminal at the port of Eemshaven.

Exmar reported first-quarter revenues of \$24.3 million, which was less than the \$31M posted in the same three months of 2021.

Consolidated income amounted to \$45.7M in the first quarter versus \$52.8M in the prior-year quarter.

However, Exmar said it had now reached agreement for a five-year charter deal with Dutch utility Gasunie for the employment of its floating LNG barge, known as "FSRU S188".

"The decrease in revenue is mainly due to the unemployment of the FSRU S188 since June 2021," said the Antwerp-based company of the vessel built in China.

"Exmar and Gasunie are joining forces to enhance European energy security with the employment of the 'FSRU S188' as a floating LNG import terminal at Eemshaven in Groningen," explained Exmar.

"The barge will be transported from Singapore to the Netherlands in May and is expected to arrive at its employment location at Eemshaven early August 2022," added the company.

"Water heat recovery for the LNG regasification process and power from shore are envisaged in order to further minimize the environmental impact within the port," stated Exmar.

The company was also continuing employment talks for the "Tango FLNG" production hull previously chartered for natural gas liquefaction in Argentina.

"With 'Tango FLNG, being a fast-track solution to develop LNG exports, various firm discussions are ongoing for its next employment," explained Exmar.

The new Dutch LNG facility will operate under the name EemsEnergy Terminal and affiliated structures were currently being planned, including mooring for the FLNG barge.

Gasunie has said it would be responsible for taking care of connecting Eemshaven LNG to the nationwide gas pipeline network and distributing the gas across the Netherlands.

Exmar also owns an LNG carrier "Excalibur" and the ship is not currently chartered. The rest of its fleet of around 40 vessels are chartered, managed or joint venture ships in the liquefied petroleum gas (LPG) and pressurized gas markets.

"The spot market is challenging due to shorter ton-mile as a result of strong European product pricing," said Exmar.

"For our LNG carrier 'Excalibur', currently unemployed, we remain positive and are working on various trading or infrastructure possibilities," the company added.

Exmar also has three Very Large Gas Carriers (VLGCs) in its fleet as well as Midsize Gas Carriers (MGCs).

"The three VLGCs continued to perform under their current contracts. The VLGC market prospects for the remainder of the year and into 2023 are promising with increased production expected," said Exmar.

"The Midsize market stayed stable during the first quarter of 2022 and prospects are positive for the remainder of the year despite uncertainties," said the company.

VLGC time-charter equivalent rates came to \$31,889 per day and Midsize rates were at \$23,602 a day.

"We expect an increase in LPG production and a replacement of the loss of Russian exports of ammonia by longer ton-mile sourced from the Middle East and the Far East," Exmar added. The company's LPG carrier "Brussels" was delivered to new owners in January 2022.

EXXONMOBIL Corp. posted first-quarter 2022 earnings of \$5.58 billion compared with \$2.73Bln in the prior-year quarter and \$8.87Bln in the previous three months with a \$3.4Bln hit taken on exiting Sakhalin-1 oil in the Russian Far East amid progress on Mozambican LNG and Permian Basin activities.

Oil-equivalent production was 3.7 million barrels per day, down 4 percent from the fourth quarter of 2021 due to weather-related unscheduled downtime, planned maintenance, lower entitlements associated with higher prices and divestments.

"The quarter illustrated the strength of our underlying business and significant progress in further developing our competitively advantaged production portfolio," said Darren Woods, Chairman and Chief Executive.

"Earnings increased modestly, as strong margin improvement and underlying growth was offset by weather

and timing impacts. The absence of these temporary impacts in March provides strong, positive momentum for the second quarter," stated Woods.

Average realizations for crude oil increased 28 percent while first-quarter 2022 downstream earnings were \$300 million compared with \$1.5Bln in the fourth-quarter 2021.

"Improved industry fuels refining margins and lower expenses were partially offset by lower basestock margins and lower volumes, driven by higher turnaround activity," said the Irving, Texas-based major.

Production in the Permian Basin reached 560,000 barrels per day at the end of the quarter.

"The company remains on track to deliver a production increase of 25 percent this year versus full-year 2021 and to eliminate routine flaring by year-end," added ExxonMobil.

CEO Woods later discussed the earnings in a conference call with analysts.

"Looking forward, we're also growing our globally diverse portfolio of low-cost, capital-efficient LNG developments," explained Woods.

"In Mozambique, the 3.4 million ton per year Coral South floating LNG production vessel is being commissioned after arriving on site in January," he added.

"Coral South is on budget with the first LNG cargo expected in the fourth quarter," said Woods.

The CEO also explained that the company was making "outstanding progress" on its high-value growth developments in Guyana in South America, in the Permian and in LNG projects.

"Our new Corpus Christi chemical complex is up and running ahead of schedule and generated positive earnings and cash flow in its first quarter of operations," added Woods.

"In a broad comment on the LNG business, we're seeing across each of our sectors, the pandemic had a pretty profound effect with respect to deferring, delaying capital spend, and, therefore, additional capacity coming on. And as the pandemic has subsided and demand has recovered, we're seeing very tight markets," explained Woods.

"And then with the Ukraine and the situation there, that has added a significant additional level of uncertainty around supply," he said.

Woods said the LNG market was currently "very dynamic" and a very high-priced market.

"There is basically very full capacity utilization all around the world, maximizing the amount of LNG moving," he said.

"Obviously, we've got our Coral LNG starting up later this year, which will help contribute and ease some of that tightness. And then there is Golden Pass," added Wood.

"This is an important leg of our strategy of making sure that we have access to LNG supplies that we can supply demand all around the world," stated the CEO.

"And that's a very important part of our strategy in LNG going forward, is making sure that we've got barrels that we can then move and trade in the marketplace and move across the different regional demand centers. And so I think we're going to continue to look for opportunities in LNG," declared Woods.

The CEO pointed to opportunities in Papua New Guinea LNG that the company was progressing.

"Obviously, additional investments in Mozambique are in the future as well. And so I think it'll be a very important foundational layer of supply and a really important part of our overall business offering," he concluded.

EXXONMOBIL has signed up with US plants developer Venture Global for two long-term Sales and Purchase Agreements amounting to volumes of 2 million tonnes per annum from Louisiana LNG export plants.

Venture Global, based in Arlington, Virginia said ExxonMobil LNG Asia Pacific (EMLAP), which has an LNG trading licence in Singapore, will receive 1 MTPA from the Plaquemines export plant being developed on the banks of the Mississippi River.

A further 1 MTPA will be lifted for the ExxonMobil unit from the CP2 LNG project being designed and constructed alongside the existing Calcasieu Pass plant in Cameron Parish where several mid-scale Trains are already operating.

"This is the second supply agreement for CP2, which is expected to commence construction in 2023," said Venture Global.

This refers to a previous deal with New Fortress Energy, headquartered in New York, for 1 MTPA of LNG from the future CP2 plant. NFE is also taking 1 MTPA of LNG from Venture Global's Plaquemines facility and both deals are for free-on-board cargoes for a period of 20 years.

Venture Global said that both of its new export facilities will replicate the same

There is new energy in the heart of the Mediterranean

OLT Offshore LNG Toscana is the company which manages the floating storage and regasification unit "FSRU Toscana". The Terminal is technologically innovative and well-advanced. It guarantees the maximum standards in terms of environmental sustainability and safety. "FSRU Toscana" is permanently moored off the Italian coast – between Livorno and Pisa – in the heart of the Mediterranean Sea. The Terminal has a maximum authorized regasification capacity of 3.75 billion Standard cubic meters per year and an LNG storage capacity of 137,100 cubic meters. New SSLNG service soon available.

oltoffshore.it



design seen in operation at Calcasieu Pass, where speed of execution resulted in the production of first LNG only 29 months after the final investment decision.

The company is also developing a fourth plant on the Mississippi River called Delta LNG and would take its overall output to 60 MTPA.

“Venture Global is deeply honored that ExxonMobil has chosen to collaborate with our company across both of our next projects, Plaquemines and CP2,” said Michael Sabel, Chief Executive of Venture Global LNG.

“As a global LNG leader, ExxonMobil’s support for Venture Global’s innovation and engineering execution is a defining moment for our combined teams and the wider LNG market,” Sabel declared.

ExxonMobil is developing its own LNG export plant along the Gulf Coast at Texas in partnership with QatarEnergy on the Sabine-Neches Waterway.

However, the Qatar-ExxonMobil project has advanced at a slow pace because of doubts several years ago over market demand issues that have now been resolved and work has gathered pace to construct three liquefaction Trains with around 16 million tonnes per annum of output.

ExxonMobil, based in Irving, Texas, is also a main partner of QatarEnergy in many of its existing Trains at the huge Ras Laffan complex in Qatar in the Arabian Gulf.

Commenting on the SPAs with Venture Global senior Vice President of LNG for the ExxonMobil Upstream Co., Peter Clarke, said LNG has an important role to play in helping lower emissions in the industrial sector.

“We look forward to working with Venture Global as we continue to grow ExxonMobil’s LNG portfolio and progress our plans to reliably deliver natural gas from the US Gulf Coast to global markets,” added Clarke.

FLEX LNG, the Norwegian shipping company with a fleet of 13 modern vessels and several chartered to the largest US exporter, reported an 18 percent jump in first-quarter net income even amid spot freight market challenges at the end of the three months as the LNG trade abruptly shifted towards Europe from Asia.

Flex’s first-quarter net income jumped to \$55.76 million from \$47.22m in the prior-year quarter.

Vessel operating revenues were lower in the first three months of 2022 at \$74.57M versus \$81.26M in the same quarter of

2021 and much lower than the \$114.59M logged in the final quarter of 2021.

The company, which was founded by Norwegians, is listed on the New York Stock Exchange and the Oslo Børs in Norway and is headquartered in Hamilton, Bermuda, said ship operating expenses came to \$14.35M compared with \$14.25M in the prior-year quarter.

Flex said average Time Charter Equivalent (TCE) rates were \$62,627 per day for the first quarter of 2022 compared with \$95,908 per day for the fourth quarter of 2021.

“The first quarter was a fantastic period to be a cargo owner with high demand and elevated prices for LNG given the global energy crunch,” said Øystein M Kalleklev, Chief Executive of Flex LNG Management.

“For the spot freight market the first quarter was, however, challenging as the LNG trade abruptly shifted towards Europe resulting in lower sailing distances and thus higher availability of ships, depressing freight economics as liquidity in the spot market also dried up,” explained the CEO.

“The sentiment in the freight market did, however, turn positive during the end of February and spot rates for modern tonnage have now recovered to above the seasonal average while the one-year and three-year Time Charter rates remain very strong,” added Kalleklev.

“This is evidencing that charterers are willing to pay a substantial premium to spot rates in order to lock in large fuel-efficient ships on longer periods as the forward market also prices in a much tighter freight market in the second half of the year,” the CEO noted.

On the financing front, Flex said that in March it signed a \$375M term and revolving credit facility with an accordion option to increase this by \$125M, secured against an additional vessel.

Flex said that during the past 13 months it had successfully secured in total nine fixed-hire Time Charters with first-class counterparties.

“The minimum period of these contracts ranges from three to five years which gives us comfortable earnings visibility,” said the company.

“We still have three ships which will be redelivered from existing Time Charterers during the next 23 months and given the strong term market and general lack of available modern tonnage we are upbeat about the prospects of re-contracting these ships at attractive terms,” added Flex.

Flex said that in March an addendum to the existing time charter agreement with US exporter Cheniere Marketing was signed. The Cheniere company is the largest US LNG exporter from the Sabine Pass plant in Louisiana and Corpus Christi facility in Texas.

This addendum nominated the “Flex Volunteer” as the fourth vessel chartered to the Houston-based company and adjusting the commencement of the charter to April 2022, which was originally set to commence in the third quarter of 2022.

The charter has a fixed rate of hire and a firm period ending in the first quarter of 2026.

Then in April 2022, Flex said that the option for a fifth time charter agreement with Cheniere was declared for the vessel “Flex Aurora”.

Flex said this fixed rate charter would commence in the third quarter 2022 and has a firm period ending in the first quarter 2026.

In its overview of the market during the first quarter, Flex noted that LNG prices continued to stay at very elevated levels as a result of the natural gas shortage in Europe.

“This was further aggravated by the outbreak of war in Ukraine on February 24, 2022, which increased the perceived risk of curtailment of Russian natural gas exports through pipelines to Europe,” it added.

“Consequently, European natural gas prices have traded at significant premium to Asian prices and resulted in a shift in the trade pattern. This shift in trade pattern started in late 2021, before the war in Ukraine, due to European buyers increasing their demand for the Atlantic spot cargoes to ensure adequate supply given the low gas inventory levels,” the company explained.

“This pull of cargoes to Europe, instead of Asia, resulted in a sharp drop in sailing distances and thus freeing up more ships available for the spot market,” added Flex.

“This coupled with significantly lower activity in the spot market adversely affected spot market earnings, in regards to both headline charter rates and ballast bonus conditions,” it stated.

During the first quarter, Flex LNG employed three ships on variable hire contracts linked to the spot market as well as approximately 1.5 ships in the spot market.

The ships operating in the spot market were the “Flex Volunteer” for the full quarter and “Flex Aurora”, which was

redelivered from a 17-month fixed hire Time Charter at the beginning of February.

“Hence, earnings for these ships were considerably lower than in fourth quarter when spot market earnings were at an all-time high,” said Flex.

The company’s fleet of vessels consists of next generation LNG carriers with two-stroke engines.

Nine vessels have M-type Electronically Controlled Gas Injection (MEGI) and four vessels have Generation X Dual Fuel (XD-F) propulsion systems.

Three of the Flex MEGI vessels are equipped with full re-liquefaction systems (FRS) and four of the MEGI vessels are equipped with partial re-liquefaction systems (PRS), which reduces the active boil off rate to 0.035 percent and 0.075 percent respectively.

The remaining six vessels have a passive boil-off rate of 0.085 percent.

GERMAN LNG Terminal GmbH, the developer of the Brunsbüttel import terminal on the Elbe River north of Hamburg, welcomed the planning status accorded by the Federal Minister for Economic Affairs and Climate Action Robert Habeck for the development of energy import infrastructure across northern Germany.

“The rapid development of an LNG infrastructure is an essential and necessary contribution to the diversification of energy imports and thus to energy security in Germany,” said German LNG Terminal Chief Executive Michael Kleemiss.

“Both via temporary solutions for floating terminals (FSRUs) as well as future-proof, permanent import infrastructures, which are also being considered for the supply of increasingly climate-neutral energy sources,” added Kleemiss.

“Our terminal therefore fits perfectly into the overall planning and will make a sustainable contribution,” stated the CEO.

The Brunsbüttel import facility has already signed a preliminary accord with Shell to acquire cargo volumes.

The German Federal Government, though the state investment body Kreditanstalt für Wiederaufbau (KfW), has replaced Dutch storage company Royal Vopak in the shareholder line-up, though the dominant company is still the Dutch utility Gasunie.

The German utility RWE, based in Essen, has also signed a memorandum of understanding to join the Brunsbüttel project.

It will have two LNG storage tanks, each with a capacity of 165,000 cubic metres, allowing for flexible logistics for LNG storage and retrieval, as well as an LNG regasification system.

The terminal will have a throughput capacity of up to 8 billion cubic metres of natural gas per year and may be expanded to cope with 10 Bcm.

Small-scale LNG carriers and bunkering vessels will also be catered for at the facility.

The German LNG Terminal company said it believed that LNG would become “greener” in the future.

“Due to its location and the industrial connection, the Brunsbüttel site has good prerequisites for developing into an import hub for a northern German economy and synergies with neighbouring industries established in the coast of the state of Schleswig-Holstein,” the statement continued.

“The shareholder structure chosen with extremely experienced companies will not only ensure the fastest possible completion of the project, but also the successive use of climate-neutral energy sources,” it added.

Minister Habeck, who is a member of the Greens Party in the German coalition government, has also asked environmentalists to drop their lawsuit against another German LNG project, the floating LNG venture planned for the North Sea Port of Wilhelmshaven.

The Wilhelmshaven FLNG project involving German utilities is likely to have two floating storage and regasification units deployed.

Environmental Action Germany (DUH), which agitates against the hydrocarbons industry, has filed a demand, calling for a halt to construction activities in Wilhelmshaven because the presence of FSRUs and associated infrastructure could put at risk wildlife.

GTT, the French designer of maritime liquefied natural gas storage and fuel tanks, has won approval from France’s classification society Bureau Veritas for a new ballast-free LNG bunker and feeder vessel.

GTT said it gained approval in principle from Bureau Veritas for the “Shear-Water” ballast-free concept.

“The majority of merchant vessels worldwide use ballast water when they are empty or partially loaded to maintain seaworthy conditions,” explained GTT.

“Therefore, a considerable quantity of ballast water is carried by ships every

day. Even when ballast water is treated, there is a risk of transferring harmful aquatic organisms and pathogens from one area to another,” it noted.

“The solution developed by GTT eliminates this risk completely. In addition, removing the ballast water treatment system also reduces the energy consumption and CO2 footprint of the vessels,” added GTT.

GTT said that its “Shear-Water” concept was based on the currently proven vessel of 18,700 cubic metres capacity with two membrane tanks.

“The design also features a new hull shape, in a ‘V’, which differs from the standard square shaped mid-ship sections traditionally used for LNG carriers,” said GTT.

The Paris-based company explained that “an exhaustive testing campaign” has been carried out at the HSVA Hamburg (Germany) tank test facility in connection with power-speed, manoeuvrability and general seaworthiness.

“A sloshing test campaign has also been carried out by GTT to ensure the technical feasibility of the project and the excellent results obtained helped approve the concept,” added GTT.

Previous Approvals in Principle for the “Shear-Water” concept have been received from the China Classification Society and the European class society DNV.

“We are proud to have developed ‘Shear-Water’, an innovative ballast-free design for LNG bunker and feeder vessels,” said GTT Chairman and Chief Executive Philippe Berterrotière.

“This new technological solution allows a reduction in investment and operating costs, simpler operations as well as a reduction in corrosion supporting a longer service life,” he added.

Mathieu De Tugny, Vice-President of Bureau Veritas, said the GTT design had clear performance and environmental benefits.

“These include less onboard equipment, easier maintenance of the void spaces surrounding the cargo and reduced propulsion power requirements,” added De Tugny.

“Bureau Veritas has monitored and reviewed all the test results performed to support its approval in principle,” he stated.

HOEGH LNG Holdings, the leading floating storage and regasification unit (FSRU) operator with 10 modern vessels, has appointment Erik Nyheim as new President and Chief Executive

effective from mid-August. Nyheim comes from the position as Partner of Boston Consulting Group’s Norwegian office where he has successfully led their maritime practice since 2019.

Prior to this, he worked for more than 15 years with the Norwegian Wilhelmsen group.

Nyheim holds a BSc Economics and Business Administration from the Norwegian School of Business and Administration (NHH) in Bergen.

“We are very pleased to welcome Erik to lead the company at a very exciting time,” said Høegh LNG Board Chairman Morten W. Høegh.

“He will bring important and relevant experience for the role as President and CEO, enabling us to successfully realise our vision of enabling the transition to clean energy,” the Chairman added.

Nyheim stated that it was a “great honour” to be appointed as the next President and CEO of Høegh LNG.

“I am impressed by how the company has developed to become the world’s leading owner and operator of FSRUs and look forward to leading the next phase of the company’s development in a period when security of supply and energy transition are high on the agenda,” explained Nyheim

“I am excited about getting to know the business and all its people when I join later in the summer,” he stated.

Høegh LNG Holdings, which is headquartered in Bermuda, is jointly owned by the Norwegian Høegh family and Morgan Stanley Infrastructure Partners.

Larus Holding Limited is the ownership entity and is a 50-50 joint venture between Leif Høegh & Co. Ltd. and funds managed by Morgan Stanley Infrastructure and it also owns around 46 percent of Høegh LNG Partners LP.

Høegh LNG has also recently decided that it would likely sell the FSRU “Independence” operating as an import terminal for the Baltic state of Lithuania.

The Lithuanian energy and storage company, Klaipėdos Nafta, the charterer of ‘Independence’, has publicly announced that it intended to exercise its purchase option to acquire “Independence” at the end of the existing charter, which runs until the fourth quarter of 2024.

JAPAN PETROLEUM Exploration (Japex), which operates the main LNG import terminal in Japan’s Fukushima Prefecture and has a stake in an LNG receiving terminal in the Vietnamese port

city of Haiphong, said it was also planning to expand its shale oil and gas interests in the US.

The Japex US subsidiary acquired certain interests at the start of 2022 in tight oil development projects in the Eagle Ford shale formation in southern Texas and has decided to acquire additional wellbore interests in the Eagle Ford and the Woodford formation in southern Oklahoma.

Japan, based in Tokyo and in which the government has a one-third stake, said it would invest around \$500 million from 2022 to 2024 to develop tight oil interests in the southern US in its already acquired interests and in others to be taken over later in 2022.

“Under the Japex strategy, the shale (tight) formation development in North America is a priority focus area for the acquisition of new positions, as early profit contribution can be expected and we can leverage our experience and expertise in this area,” stated the company.

Japex has participated in the tight oil development business in the US since 2012 by acquiring development interests in the Eagle Ford formation in Middle McCowen, southern Texas.

“Since that time, it has continuously invested in the development of the acquired interests, including the acquisition of additional interests in the same formation in 2013,” the company explained.

In its LNG business, Japex signed a share purchase agreement with a Vietnamese joint venture company called Iteco in January 2022 to develop a Vietnamese LNG import project in the Nam Dinh Vu Industrial Park.

The terminal will initially handle up to 650,000 tonnes per annum of LNG and is expected to come online in 2025, subject to a final investment decision.

Japex has said that the project, which also includes procurement, storage, and supply of LNG, has already received government approval.

In Japan, the company has built a network of high-pressure natural gas pipelines, extending to a total of 800 kilometres and the infrastructure is central to the Japanese domestic gas supply network.

The company’s own Japanese import terminal at Soma port started operations in 2018 and is the first large-scale LNG terminal in Fukushima Prefecture, comprising two tanks with a capacity of 230,000 cubic metres.

The terminal receives and stores LNG

from overseas and regasified cargoes are fed into the pipeline gas grid, also serving a nearby power plant, or can be distributed along the coast or loaded onto trucks.

Japex additionally operates a small-scale LNG carrier with 4,800 cubic metres capacity and the Soma terminal has five lanes for LNG tank trucks.

JERA Co. Inc., the main Japanese LNG importer, is taking a series of new measures to ensure a stable supply of electricity in Japan in the face of a changing market and geopolitical events.

“Due to factors such as Russia’s invasion of Ukraine and the rapid pace of decarbonization, the environment surrounding the energy business is changing dramatically with sharply rising resource prices and energy security growing in importance,” explained JERA.

“In addition, the impact of the 16 March 2022 earthquake centred off the coast of Fukushima caused extended shutdowns at thermal power plants in some areas that mean the outlook for domestic electricity supply-demand remains tight,” it stated.

JERA is a 50-50 joint venture between Tokyo Electric Power Co. Holdings and Nagoya-based Chubu Electric Power, and handles over 30 million tonnes per annum of LNG imports and accounts for about 40 percent of Japan’s annual imports of the fuel.

As Japan’s largest power producer, JERA said it would be taking a series of measures to ensure operations at its thermal power plants to guarantee the supply of electricity in Japan.

On fuel security and LNG, JERA said it was moving to ensure a steady flow to Japan for its power needs.

“In response to sudden increases in demand during the high-demand summer and winter periods, JERA contributed to fuel supply stability by procuring a record volume of approximately 4.5 million tonnes of (spot) LNG through JERA Global Markets,” it said.

“From this fiscal year onwards, JERA will continue to cooperate with stakeholders to secure fuel in a timely manner in line with the domestic electricity supply-demand situation, and will strive for flexible procurement to contribute to fuel supply stability,” JERA declared.

The company controls a fleet of around 20 LNG carriers and currently operates and provides fuel for a total of 26 power plants in Japan and imports LNG into

11 of Japan’s network of 37 terminals.

JERA also stated that it was resuming operations at thermal power plants, which were previously under long-term planned shutdown.

The company recalled that as an electricity supply-demand countermeasure for last winter, it contributed to the stable supply of electricity by resuming operations at the Anegasaki Thermal Power Station Unit 5, which had been under a long-term planned shutdown.

“In preparation for the summer of 2022, Sodegaura Thermal Power Station Unit 1 was readied for operation on April 17 in response to requests to avoid tight supply-demand,” noted JERA.

“Considering the electricity supply-demand situation going forward, JERA will continue to prepare to respond to requests from stakeholders by closely examining the details and duration of work required to resume operations at Anegasaki Thermal Power Station Unit 5 and other thermal power plants under long-term planned shutdown,” the company explained.

JERA added that it was additionally moving forward with replacement work at four thermal power sites.

“State-of-the-art thermal power plants with a total capacity of approximately 6.66 gigawatts are scheduled to begin operations in stages from FY 2022 to 2024,” said the company.

JERA said that it would steadily move forward with this work, contributing to the stable supply of electricity while also utilizing electricity generated through trial operations at the power plants under construction.

Among the new plants, the coal and biomass-fuelled Taketoyo Thermal Power Station is under construction in Aichi Prefecture and was scheduled to start operations in August 2022.

KOSMOS ENERGY, the US-based shareholder in the floating liquefied natural gas joint venture offshore the West African nations of Mauritania and Senegal, swung to a profit from a prior-year loss as more progress was made on the FLNG project.

Kosmos, a specialist in Atlantic Margin exploration and production and based in Dallas, Texas, reported a first-quarter net profit of \$1.4 million compared with a loss of \$90.76M in the first three months of 2021.

Total revenues and other income soared to \$659.06M versus \$176.57M in the same quarter of last year.

Kosmos, which is developing FLNG with UK major BP offshore Mauritania and Senegal and centred on the Greater Tortue-Ahmeyim gas fields, said Phase One of the Greater Tortue LNG venture was about 75 percent complete at quarter-end.

The company’s net production came to 72,600 barrels of oil equivalent per day and sales were 72,400 boe per day.

The first Mauritania-Senegal FLNG production facility is scheduled to have first gas in early 2023.

“With our low-cost, high margin oil assets that generate cash to pay down debt and invest in our deep portfolio of world-class gas assets, we believe we have the right portfolio at the right time,” said Chairman and Chief Executive Andrew G. Inglis.

“We are well positioned for the energy transition and believe we will have an increasingly important role to play in providing energy security to countries looking to diversify from current supply sources with cost competitive and geographically advantaged LNG,” stated Inglis.

“Kosmos had a strong first quarter operationally and financially, with production at the top end of guidance and free cash flow of around \$220M,” he added.

“We are continuing to invest in our differentiated portfolio which has the potential to grow production around 50 percent between 2022 and 2024 while increasing the gas weighting of our portfolio,” explained Inglis.

The Greater Tortue-Ahmeyim LNG project has made more steady progress in 2022 on the production vessel and the Floating Production Storage and Offloading (FPSO) unit.

“The FLNG hull commenced pipe rack outfitting and equipment installation and testing,” said Kosmos.

“For the FPSO mooring piles have been pre-installed offshore and work on the FPSO in the shipyard continues with mechanical completion activities and inspection tests,” the company added.

“The Hub Terminal construction continues on schedule with the 21st and final caisson shipped offshore in early March 2022 and three caissons left to be installed,” stated Kosmos.

The company added that in the Greater Tortue-Ahmeyim subsea activities, the offshore construction campaign was expected to commence in May and drilling as started with top holes completed on two of the four wells required for first gas.

Kosmos also has production assets offshore the West African nations of Ghana and Equatorial Guinea and in the US Gulf of Mexico.

During the quarter, Kosmos said it received about \$118M from UK-listed Tullow following the completion of pre-emption for the additional Ghana interests acquired in October 2021.

The Kosmos interest in the Jubilee and Tweneboa, Enyenra, Ntomme (TEN) fields offshore Ghana has been reduced by approximately 3.5 percent and 7.7 percent, respectively.

Kosmos said that it exited the first quarter of 2022 with \$2.2 billion of net debt and available liquidity of around \$900M.

“Total net debt decreased in the quarter by approximately \$330M with the strong free cash flow and the Ghana pre-emption proceeds received from Tullow,” it added.

LNG CANADA, the Shell-led project in the province of British Columbia, has named Shell executive Jason Klein as the new Chief Executive of the project, now described as 60 percent complete and also moving onto gas-processing infrastructure development to join with the Coastal GasLink.

Shell said Klein joins LNG Canada from Shell Canada, where he served as Vice President of Canada Integrated Gas. Klein replaces outgoing CEO Peter Zebedee.

The company said Klein brought to the position “a wealth of experience and a deep understanding of LNG, its role in the global energy transition to lower carbon energy and the part LNG Canada will play” in that transition.

The UK-based major noted in the statement that the project at Kitimat in BC was the largest private investments in Canadian history and was a long-life asset with a 40-year export licence that will initially produce 14 million tonnes per annum of LNG for export.

“I’m excited to join the team, especially at this time with construction in Kitimat progressing steadily and safely towards completion and the organization preparing for decades of successful operations,” explained Klein.

“LNG Canada and its joint venture participants are committed to setting the benchmark for economically, environmentally and socially responsible LNG development in Canada, creating a positive and lasting legacy with First Nations, the local community and all British Columbians based on our values of safety, collaboration, respect and transparency,” he stated.

Klein began his career with Shell in 2016, following its global acquisition of BG Group where Jason held assignments in the Middle East, Europe, North America and Australia in roles spanning the legal function, upstream operations and LNG developments over a period of 13 years (starting in 2003).

“Following the BG takeover, Klein became Vice President US LNG within Shell’s Integrated Gas business, responsible for leading its development of the Elba Island LNG project near Savannah, Georgia,” added the Shell statement.

He has a Bachelor of Science in Finance from Trinity University in San Antonio in Texas and a Doctorate in Jurisprudence from the University of Texas School of Law.

“Jason takes over accountability for LNG Canada at a very important and active time,” said Susannah Pierce, Shell Canada President and Country Chairperson.

“He has extensive background in natural gas and LNG and a commitment to ensuring LNG Canada’s relationships with First Nations, communities and other stakeholders remain strong and resilient,” added Pierce.

LNG Canada remains on track and there are currently around 5,000 Canadians employed at its Kitimat site.

A huge natural gas inlet module that will take volumes off the Coastal GasLink pipeline arrived on site in March and marked what the company said was the “next phase” of development.

MCDERMOTT, the US energy and LNG project engineering company, has outlined part of the scope of the planned Fujairah LNG production facility being developed in the fifth-largest emirate by area of the seven United Arab Emirates.

McDermott was awarded the contract by Abu Dhabi National Oil Co. (Adnoc) to provide front-end engineering and design for the plant.

The Fujairah project will be centred around a liquefaction plant with a total capacity of 9.6 million tonnes per annum.

Fujairah is located outside the Arabian Gulf on the Gulf of Oman. The shores of Fujairah extend for 70 kilometres along the coast from the city of Fujairah.

The emirate shares its boundaries with the emirates of Sharjah and Ras Al Khaimah to the west and the south respectively.

In the north, Fujairah shares its international border with the Sultanate

of Oman, an established LNG producer supplying customers in Asia.

“The plant will be designed with electric drives for the liquefaction compressors and will incorporate several features that significantly reduce greenhouse-gas emissions, capitalizing on the experience McDermott,” said the Houston, Texas-based company.

McDermott said the Fujairah plant would benefit from the “robust capabilities and experience” of the US company in FEED performance.

Our biggest differentiator is our ability to execute this FEED on a fast-track basis incorporating all of the characteristics required to support the award of EPC contracts which are expected in 2023,” said Tareq Kawash, Senior Vice President for Onshore at McDermott.

McDermott was involved in initial phases of Adnoc’s LNG development in the late 1980s that resulted in the Das Island plant in Abu Dhabi, the second-largest emirate after Dubai.

The US company constructed the storage facilities for both LNG and liquified petroleum gas (LPG) on an EPC basis on Das Island.

“We are proud to continue our long history with Adnoc by playing an important role in helping to define the next phase of LNG development in the UAE,” added Kawash.

McDermott noted that it was one of the most experienced engineering and construction firms serving the LNG market and has delivered more than 30 LNG Pre-FEED and FEED projects over the past 10 years.

The Fujairah LNG facilities FEED will be performed by teams in McDermott’s offices in London and the UAE.

NEW FORTRESS Energy Inc., the expanding LNG terminals, production development and shipping and power assets holder, reported first-quarter net income of \$241.2 million versus a loss of \$39.5M in the prior-year quarter.

The New York-based company also posted net cash flow from operations of \$114M and earnings per share of \$1.13 on a fully diluted basis.

First-quarter revenues amounted to \$505.1M compared with \$145.7M in the same three months of 2021.

NFE, whose latest project involves LNG production offshore Louisiana, said it was on track for gross full-year adjusted earnings in 2022 and 2023 of \$1.0+ billion and \$1.5+ billion respectively.

NFE’s quarterly highlights included

materially progressing its “Fast LNG” liquefaction concept in the projects on the US Gulf Coast and in Africa.

The company also “accelerated optimization initiatives associated with NFE’s floating storage and regasification (FSRU) ships portfolio” of nine FSRUs, six operational and three conversion candidates and three open or coming open in 2022.

NFE additionally executed two 20-year sale and purchase agreements with Louisiana onshore liquefaction and export plant developer Venture Global for a total 2 million tonnes per annum of LNG supplied on a free-on-board (FOB) basis.

Advanced commercial discussions were also taking place with Italian energy company Eni in relation to 1.4 MTPA (tolling arrangement with 50 percent offtake rights to NFE) per signed memorandum of understanding.

These deals relate to the Republic of Congo and the deployment of NFE’s LNG production equipment off the coast of the West African nation for a period of 20 years.

NFE has said it would set up its “Fast LNG” facility to produce LNG in the associated gas fields off the Congo.

The Republic of Congo associated gas from oil production was expected to start in the second quarter of 2023.

NFE had previously signed a first African deal with the northwest African nation of Mauritania.

That NFE agreement was for the development of an energy hub, including natural gas, power and LNG, utilizing existing offshore gas reserves owned by Mauritania as well as neighbouring Senegal.

The NFE “Fast LNG” design pairs modular, midsize liquefaction technology with jack-up rigs or similar floating infrastructure to enable a much lower cost and faster deployment schedule than floating liquefaction vessels.

NFE is additionally continuing to advance LNG-for-power projects in nations like Mexico, Nicaragua and Brazil as well as in the Caribbean and in Sri Lanka in Asia.

The company executed a 15-year natural gas supply agreement in Brazil at the end of 2021.

That deal was with a subsidiary of Norsk Hydro ASA for the supply of natural gas to the Alunorte Alumina Refinery in the northern Brazilian state of Pará.

NFE said it was advancing two Brazilian projects, one in Barcarena for

Norsk Hydro and a second in Santa Catarina in southern Brazil.

The company said it was also positioned to supply LNG through the Santa Catarina terminal for power plants with more than 400MW of capacity from the second quarter of 2022.

NEXTDECADE Corp., the developer of the Rio Grande LNG export project on the Brownsville Ship Channel in Texas, has signed a 15-year sale and purchase agreement with French utility Engie as the need for LNG supplies in Europe becomes more urgent.

Engie has agreed to purchase 1.75 million tonnes per annum of LNG on a free-on-board (FOB) basis whereby the French send their own ships to load the cargoes at the Texas plant.

Houston-based NextDecade has ultimate plans and permits to produce up to 27 MTPA of LNG from five liquefaction Trains at the Rio Grande facility.

The LNG supply will be from the first two Trains at Rio Grande with the first Train expected to start commercial operations as early as 2026.

“We are pleased to announce this SPA with Engie, a significant European energy supplier and leader in the global transition towards lower carbon energy solutions,” said Matt Schatzman, NextDecade’s Chairman and Chief Executive.

Engie was one of the French companies that had previously planned to boycott US LNG because of the use of hydraulic fracturing for shale gas in Texas, Louisiana and other states.

However, analysts note that ultra-green sensibilities have been ditched in Paris and Berlin since Russia’s invasion of Ukraine amid a growing global shortage of natural gas and increasing Asia-Europe competition.

Assuming the achievement of further LNG contracting and financing, NextDecade said it anticipated making a positive final investment decision on a minimum of two Trains of the Rio Grande project in the second half of 2022, with FIDs of its remaining three Trains to follow thereafter.

NextDecade in April 2022 signed a second cargo supply accord in a month with a Chinese company.

The company signed a 20-year SPA with the Singapore trading arm of ENN Group of China after previously signing a binding Heads of Agreement with China’s Guangdong Energy Group Natural Gas Co., for the supply of LNG cargoes, also for a 20-year term.

Under the SPA with ENN, the Chinese company will purchase 1.5 MTPA of LNG indexed to Henry Hub on a FOB basis.

NextDecade also said at the end of March 2022 that it proposed to supply Guangdong Energy with up to 1.5 MTPA of LNG, also indexed to the US benchmark natural gas price.

The Rio Grande project has been delayed several times since 2020 and was originally expected to start producing LNG in 2023.

NextDecade had extended pricing in the construction contract with US LNG engineer Bechtel Inc. and extended the validity again until July 31, 2022.

The Rio Grande project has signed a lease agreement with the Brownsville Navigation District of Cameron County in Texas for around 984 acres of land for the plant construction.

However, the start-date of the lease had to be extended as well and a further, longer extension is likely to be required.

NextDecade additionally signed an agreement in April 2021 with Mitsubishi Heavy Industries of Japan to install post-combustion, carbon-capture technology at the Brownsville plant.

Next Decade and MHI have signed an engineering services agreement for the design, license and performance guarantee of the KM CDR Process.

NYK LINE, the Japanese shipping company with US LNG investment and a fleet of 660 vessels from tankers to containerships and car carriers, has signed six long-term charters for LNG carriers with China National Offshore Oil Corp.

NYK said it concluded a long-term time-charter contract with CNOOC Gas and Power Singapore Trading & Marketing for the six LNG tankers in addition to a shipbuilding contract for the vessels with the Chinese shipyard, Hudong-Zhonghua Shipbuilding.

“This is NYK's first long-term time-charter contract for an LNG carrier with CNOOC,” said Tokyo-based NYK Line.

“The six vessels are scheduled to be delivered between 2026 and 2027 and will be mainly engaged in LNG transportation to China,” the company added.

NYK, whose LNG subsidiary owns and manages more than 30 LNG carriers, has also signed a project heads of agreement with a subsidiary of China Merchants Energy Shipping (CMES), a Chinese shipping company, to jointly own and manage the six China newbuilds.

“Under the partnership with CMES, NYK will provide stable and safe LNG transportation to CNOOC,” it explained.

The LNG carriers will be equipped with X-DF 2.1 next-generation dual-fuel engines that can operate on fuel oil or boil-off gas stored in its cargo tank.

Each of the vessels will have 174,000 cubic metres capacity, the optimum size for Atlantic-Pacific transits of the Panama Canal.

NYK has a stake in the US Cameron LNG export plant in Hackberry in Louisiana.

The facility’s investors also include Semptra Energy of the US, France’s TotalEnergies while the NYK stake is held in a joint venture with Mitsubishi Corp under the name Japan LNG Investment, while Japanese trading house Mitsui & Co. is also a shareholder in the Gulf Coast plant.

Cameron LNG is adding a fourth liquefaction Train and increasing the production capacity of the existing three Trains through debottlenecking.

The expansion project is slightly reduced in capacity. Instead of the authorized two Trains at 4.98 MTPA each, Semptra has opted for one Train with over 6 MTPA of output.

The Cameron facility has three operating Trains with a nameplate capacity of 13.5 MTPA.

PETRONET LNG, the owner of the largest Indian cargo import terminal at Dahej north of Mumbai, reported an 18 percent increase in net profits and a 58 percent surge in annual revenues even as India’s LNG imports showed a year-on-year decline.

Net profits for the year to the end of March 2022 rose to 3,438 crore rupees (\$445 million) versus 2,939 crore rupees (\$380M) in the previous 12-month period.

Petronet reported total consolidated revenues of 43,466 crore rupees (\$5.63 billion) for the fiscal year compared with 26,381 crore rupees (\$3.42Bln) in the previous fiscal year.

Fourth-quarter net profits came to 791

crore rupees (\$102.4M) versus 637 crore rupees (\$82.5M) in the same three months of the previous year.

The Petronet Board recommended a final dividend of 4.50 rupees per share.

Most of India’s LNG imports are handled at the Dahej import terminal followed by Hazira, owned by Shell India, and Dabhol, the terminal controlled by Gas Authority of India (GAIL).

Petronet’s Dahej facility has capacity to handle 17.5 million tonnes per annum of LNG and with six storage tanks and two more planned.

The company also owns the Kochi terminal in the southwest state of Kerala and is additionally planning a third terminal and its first on the East Coast at the Port of Gopalpur in the state of Odisha.

Petronet added in its earnings statement that the company achieved a throughput of 847 trillion British thermal units in the fiscal year to the end of March compared with throughput of 896 TBTU in the previous year.

“The Dahej terminal processed 178 TBTU of LNG versus 196 TBTU during the previous quarter to the end of December and 204 TBTU processed during the same quarter of 2021,” said Petronet.

The overall LNG volume processed by the company in the last quarter to the end of March was 190 TBTU compared with the LNG volumes processed in the previous and corresponding quarters, which stood at 208 TBTU and 218 TBTU respectively.

Petronet is listed on the Bombay Stock Exchange (BSE), the oldest in Asia.

The Dahej utilisation rate since April 2021 to the start of April 2022 was 88.5 percent. The Kochi facility had fiscal year usage averaging around 21 percent for its 5 MTPA of capacity as the southwest awaits more pipelines and associated infrastructure.

Indian LNG imports in the fiscal year declined by 3.4 percent, though still amounted to 350 cargoes even as costs jumped by 40 percent to almost \$12Bln.

India has a network of six terminals, though the nation has been slow to expand on a geographical basis. They handled 23.61 million tonnes of LNG in the 12 months to the end of March 2022.

This was down on the 24.44MT received and regasified in the same 12 months of the previous fiscal year, according data from the Indian Ministry of Petroleum and Natural Gas.

The Ministry data showed that LNG imports for the month of March 2022 tumbled by 12 percent, the seventh straight monthly fall, to 1.93MT, or 28

cargoes, versus the 2.20MT, or 32 cargoes, received in March 2021.

While LNG imports have declined every month since September 2021 more domestic pipeline natural gas has been coming ashore from the Bay of Bengal to satisfy an increasing amount of Indian demand.

Indian production of natural gas in the past fiscal year came to 34.024 billion cubic metres, marking a surge of 18.7 percent on the 28.673 Bcm logged in the 2020-2021 fiscal year.

The revived Krishna-Godavari Basin of Eastern India has seen production jump and will rise further in the future from development projects involving the Indian group Reliance Industries and UK major BP as well as Oil and Natural Gas Corp. of India.

LNG deliveries to Indian terminals come mainly from Qatar, which provides over one-third of volumes, as well as West Africa, the US, Asian nations, Australia, Russia and the spot market.

Petronet was formed by the Government of India in 1998 specifically to import LNG.

Shareholders in Petronet, which began operations in 2004, include the other big Indian energy players, GAIL, Indian Oil, Bharat Petroleum Corp. and Oil and Natural Gas Corp.

RELIANCE Industries, the Indian conglomerate and a leading oil, natural gas and chemicals company supplying rising gas volumes to supplement LNG imports, reported a jump in earnings from energy exploration and production amid higher gas prices for more Bay of Bengal volumes.

The main domestic exploration and production portfolio of Reliance comprises conventional oil and gas blocks in the Krishna Godavari Basin KG-D6 block on the East Coast of India and the Mahanadi Basin as well as two coal-seam gas (CSG) blocks, Sohagpur (East) and Sohagpur (West) in Madhya Pradesh state in central India south of New Delhi.

The Reliance oil and gas exploration and production division reported revenues for the fiscal year to the end of March 2022 increased 3.5-fold to 7,492 crore Indian rupees (\$973.2M) versus 2,140 crore rupees (\$277.9M) in the previous year.

Reliance’s KGD6 projects are in partnership with UK major BP. They have brought on stream two out of three development blocks.

The onstream fields are called R-Cluster and the Satellite-Cluster and

Diary of events

World Gas Conference 2022
23 - 27 May 2022
EXCO (Daegu Exhibition & Convention Centre) 10, Exco-ro, Buk-gu, Daegu, South Korea
<https://www.wgc2022.org>

Gastech Exhibition and Conference 2022
5-8 September
Fiera Milano, Italy
<https://www.canadagaslng.com>

the third, which is still to start up, is called the MJ field.

“MJ field development work is on track to commence production by the third quarter of fiscal 2023 (year-end 2022) with the commencement of the lower and upper well completion campaigns,” Reliance explained.

The Floating Production Storage and Offloading (FPSO) platform construction activities are on schedule and the vessel is expected to arrive in India in the July-to-September quarter of 2022.

“The final offshore field installation campaign is in progress despite adverse weather conditions and unusual currents encountered during execution,” stated Reliance.

Fourth-quarterly E&P revenues came to 2,008 crore rupees (\$261M) compared with 848 crore rupees (\$110M) in the prior-year quarter.

“This was primarily due to higher production from KGD6 post commencement of gas production from the R-Cluster and the Sat-Cluster field coupled with higher gas price realisation in KGD6 and coal-seam gas,” said Reliance.

The company said the average price realization for KGD6 gas was \$4.92 per million British thermal units in fiscal 2022 versus \$3.96 per MMBtu in the previous fiscal year.

Reliance added that the current combined average production from these two fields was 18.0 million standard cubic metres per day.

Gas produced from KGD6 during the year amounted to 149.5 billion cubic feet.

Figures in the statement showed that CSG production in the year came to 10.2 Bcf, down from the previous year’s 11.8 Bcf.

Reliance said the average gas prices realised for KGD6 in the fourth quarter jumped to \$6.13 per MMBtu from \$3.99 per MMBtu in the same three months of fiscal 2021.

The company’s gas prices realised for CSG in the quarter were higher at \$7.64 per MMBtu.

The Government has also notified companies that the second-half 2022 natural gas price ceiling had been set at \$9.92 per MMBtu for the KGD6 gas.

Reliance, based in Mumbai, is a conglomerate also involved in petrochemicals, textiles, retail, telecoms and media.

Its fiscal 2022 annual net profits came to a record 67,845 crore rupees (\$8.8 billion), an increase of 26.2 percent.

Revenues from the huge Reliance

Consolidated Oil and Chemicals division soared 56.5 percent on the year to 500,900 crore rupees (\$65Bln) primarily on account of an increase in crude oil prices and higher price realisation of downstream products.

Gross earnings from oil and chemicals came to 52,722 crore rupee (\$6.85Bln) primarily on account of better transportation fuels margins due to demand revival, higher domestic product placement for polymers and polyesters and optimized operations across energy, feedstock and product mix.

“Despite the ongoing challenges of the pandemic and heightened geopolitical uncertainties, Reliance has delivered a robust performance in 2021-2022,” said Mukesh D. Ambani, Chairman and Chief Executive.

“The gradual opening up of economies coupled with sustained high utilization rates across sites and the improvement in transportation fuel margins and volumes have bolstered our earnings,” explained Ambani.

“During the year, Reliance has also been able to generate significant employment opportunities for the people of our country and continues to remain amongst India’s largest private sector employers,” the Chairman added.

“The Oil and Gas business is now contributing 20 percent of domestic gas production,” he declared.

“I am particularly happy with the progress our company is making in the New Energy and New Materials business. We are forging ahead with the development of our New Energy Giga Factories complex across 5,000 acres in Jamnagar (Gujarat),” Ambani said.

“I am confident that Reliance will create sustainable and affordable new energy solutions for India to help her meet growing energy needs, while ensuring that we achieve our ambitious target of Net Carbon Zero,” he concluded.

SEMPRA Infrastructure, the owner of LNG assets on the US Gulf Coast and Mexico, has signed a preliminary supply accord with the Polish Oil and Gas Company for 3 million tonnes per annum of shipments from Louisiana and Texas.

A heads of agreement (HOA) was signed for a potential Polish deal with the cargoes delivered on a free-on-board bases from Sempra’s Cameron LNG plant at Hackberry in Louisiana, which is being expanded.

“The agreement underscores our commitment to help provide greater

energy security to Poland and our global partners through long-term LNG sales,” said Dan Brouillette, President of Sempra Infrastructure, an affiliate of San Diego, California-based utility Sempra.

“Our relationship with PGNiG is core to this commitment, and we are excited to continue working closely with them to advance more reliable, secure and increasingly clean energy solutions,” added Brouillette.

Iwona Waksmundzka-Olejniczak, President of Polish Oil and Gas, said the accord paved the way for negotiations of detailed terms.

“LNG is already one of the cornerstones of our diversified strategy to enhance Polish energy security, as well as to strengthen the commercial potential of the PGNiG Group,” she added.

Sempra stated that the accord may result in the finalization of definitive 20-year LNG sale and purchase agreements (SPAs) for 2 MTPA from the Cameron LNG Phase 2 project expansion in Louisiana and 1 MTPA from the Port Arthur LNG project under development in Texas.

“The HOA also provides PGNiG the opportunity in 2022 to reallocate volumes from the Cameron LNG Phase 2 project to the Port Arthur LNG project,” explained Sempra.

Sempra’s Cameron LNG Phase 2 expansion will be in the form of a single LNG Train with a production capacity of around 6.75 MTPA of LNG.

The plant will also be subject to a debottlenecking process to increase the efficiency and output of the existing three liquefaction Trains.

Sempra has now put the Port Arthur project in Texas back on the fast track route to development.

The proposed Port Arthur LNG plant has all its regulatory permits and will be constructed on a 3,000-acre site in Jefferson County in Texas and with an initial 13.5 MTPA of capacity.

SNAM, the Italian LNG importer and natural gas pipeline operators and its Spanish counterpart Enagás, have signed an accord on establishing a direct offshore gas pipeline connecting Spain with Italy as a way partially easing the European Union energy supply chain worsened by the Ukraine conflict.

SNAM said the memorandum of understanding with Enagás was signed on May 11 and jointly mandates a technical feasibility study aimed at the potential construction of the pipeline to

further diversify energy supply towards Italy and the rest of Europe.

The company stated that it was not active in the Russian market and did not hold investments in Russian companies, including joint ventures.

“At the moment, flows from Russia are continuing uninterrupted, but the uncertainty and fear of possible impacts on supply have sparked a significant rise in gas and oil prices,” SNAM noted.

SNAM, whose name comes from Societa Nazionale Metanodotti (National Pipeline Company), operates the gas grid and the onshore Panigaglia LNG facility in the northwest near Genoa as well as having a 49 percent stake in the LNG facility, the “FSRU Toscana”, moored off the Italian coast between the cities of Livorno and Pisa.

Enagás as well as being the Spanish grid operator also runs most of the Spanish LNG terminals and is a key destination for US LNG exports.

SNAM revealed the Spain-Italy gas pipeline accord in its first-quarter earnings report where it posted a 3.8 percent increase in net profits to €325 million (\$340M) from €313M in the same three months of 2021.

Total revenues, net of energy costs, amounted to €808M in the first quarter of 2022, up 14.8 percent on the same period of 2021.

“The increase is attributable to the growth of our energy transition businesses, notably energy efficiency activities and the regulated businesses and due in part to one-off income connected with the sale of gas inventories from past years owned by SNAM,” said the Milan-based company.

SNAM said that on LNG imports the Panigaglia terminal received only 0.13 billion cubic metres of LNG to regasify, well down on the 0.38 Bcm total in the first quarter of 2021.

Only three LNG carriers were unloaded at Panigaglia versus seven shipments in the prior-year quarter.

“The reduction in the volume of activity is attributable to price dynamics and, in particular, the increase in Algerian LNG flows to France and Spain compared with Italy,” explained SNAM.

“Beginning in April 2022, this trend reversed, with a consequent increase in carrier unloading and volumes regasified by GNL Italia,” it added.

Stefano Venier, SNAM’s Chief Executive, said the first-quarter results underscored the sound foundation of SNAM’s core business.

“Our transport, storage and regasification infrastructure confirms its key role in the current complex geopolitical environment,” added Venier.

SNAM said that the volume of gas handled within the storage system in the first quarter amounted to 6.10 Bcm, down 0.45 Bcm or 6.9 percent compared with the first quarter of 2021.

“The reduction is mainly attributable to a decline in withdrawals from storage as a result of the milder temperatures recorded in the first quarter of the year compared with the corresponding period of 2021,” the company said.

Natural gas injected into the National Gas Transportation Network in the first quarter totalled 19.46 Bcm, up 1.24 Bcm or 6.8 percent, due to a reduction in recourse to storage in response to the increase in gas demand in Italy and an expansion of exports.

SNAM added that Italian natural gas demand in the first three months of 2022 amounted to 25.53 Bcm, an increase of 1.3 percent on the same period in 2021.

“This growth is mainly attributable to the increase in consumption in the thermal generation sector (+0.82 billion cubic metres, or 10.4 percent) due to an increase in electricity demand, while hydro-electric output and electricity imports declined,” the company explained.

SNAM said in its outlook that the most recent projections for the evolution of natural gas demand in Italy this year pointed to a decline compared with 2021, due in particular to the effect of the increase in energy prices in the industrial sector and for expected warmer temperatures compared with those recorded in 2021.

TC ENERGY, the North American natural gas pipelines and energy transportation group, reported a first-quarter profit compared with a loss in the prior-year period as it boosted LNG feed-gas provisions.

The company’s US Natural Gas Pipelines division registered a 5 percent increase in average flows of 30 billion cubic feet per day, including an all-time daily delivery record of 35 Bcf per day in January 2022.

“Today, around a quarter of the US LNG export volumes travel through our US natural gas pipelines,” said Calgary, Alberta-based TC Energy.

The company said the earnings were underpinned by solid utilization and reliability across all its assets, further supported by the constructive

fundamental outlook for North American energy.

“The growing need for energy security has placed renewed focus on the long-term role our infrastructure will play in responsibly fulfilling North America’s energy demands,” said TC Energy.

The company said quarterly net income attributable to common shareholders came to C\$400 million (US\$312M) compared with a loss of C\$1.05 billion (US\$816.5M) in the same three months of 2021.

Segmented earnings were C\$1.2Bln compared with segmented losses of C\$900M in 2021 and comparable gross earnings came to C\$2.4Bln compared with C\$2.5Bln in 2021.

In the Canadian Natural Gas Pipelines operations TC Energy said the Coastal GasLink from the Montney Shale Basin in northeast British Columbia to the Pacific Coast for the LNG Canada project at Kitimat was now about 63 percent complete.

“The entire route has been cleared, grading is more than 74 percent complete and more than 275km of pipeline has been installed, with reclamation activities underway in many area,” added TC Energy.

The company also announced the signing of option agreements in March 2022 to sell a 10 percent equity interest in the Coastal GasLink Pipeline Limited Partnership (Coastal GasLink LP) to Indigenous communities across the project corridor.

“The opportunity to become business partners through equity ownership was made available to all 20 First Nations holding existing agreements with Coastal GasLink LP,” added the company.

TC Energy’s President and Chief Executive François Poirier said the first quarter showed the company had a “diversified and opportunity-rich portfolio of essential energy infrastructure assets” and continued to deliver strong results.

“By working closely with our customers, we are developing long-term strategic partnerships and innovative energy solutions with the expectation of sanctioning over C\$5 billion of new projects annually, in line with our historic risk and return preferences,” stated Poirier.

“The global environment continues to be complex, representing an urgent need to develop greater energy security,” he explained.

“Flows and utilization levels across many of our systems are robust, with the NGTL System having its highest average winter demand since 2000 of

14.2 Bcf per day,” added the CEO.

TC Energy continued to advance its C\$25Bln secured capital program by investing C\$1.7 billion in various growth projects.

The company received approval from the US Federal Energy regulatory Commission for the Alberta XPress and North Baja XPress natural gas projects in April 2022.

The Alberta XPress venture will underpin US LNG supplies while the North Baja Pipeline System will boost natural gas availability in Arizona and California and in Mexico

TC Energy has said its Alberta XPress was a market-driven response to rising demand for natural gas on the US Gulf Coast and beyond.

“AXP will utilize existing capacity on TC Energy’s Great Lakes Gas Transmission (GLGT) system and ANR Pipeline system, with facility expansions taking place along ANR’s Southeast Mainline (SEML). Project work will strengthen the reliability of the region’s natural gas transportation infrastructure and available supply sources,” it added.

TC Energy also received notice on March 29, 2022 from the Government of Alberta that the final project proposal to build and operate the Alberta Carbon Grid, a joint-venture with Calgary-based Pembina Pipeline Corp., moves forward to the next stage.

In the Mexico Natural Gas Pipelines business, TC Energy said the Tula and Villa de Reyes pipeline projects are the subject of arbitration initiated in June 2019 by the Comisión Federal de Electricidad (CFE) disputing fixed capacity payments due to “force majeure” events.

“Arbitration proceedings are currently suspended while management holds collaborative settlement discussions with the CFE,” added TC Energy.

“We successfully achieved mechanical completion of the Villa de Reyes project’s lateral and north sections in April 2022,” explained the company.

The 420-kilometres (260 miles) pipeline runs from Tula via Hidalgo and ends in Villa de Reyes at San Luis Potosí.

The Villa de Reyes pipeline will transport natural gas to power generation facilities in Central Mexico.

“Construction of the south section is ongoing and we expect to complete the construction of the Villa de Reyes project in 2022, subject to the successful resolution of ongoing negotiations with neighbouring communities to obtain pending land access,” it said.

TELLURIAN Inc., the developer of the Driftwood LNG export project in Louisiana, reported a rise in revenue from natural gas production because of increased prices and volumes from its Haynesville Shale assets as progress continued on construction preparations and LNG volume agreements.

The company generated \$26M in revenues from natural gas sales, compared to \$8.7M in the first quarter of 2021.

Tellurian said it ended the quarter with about \$296M of cash and cash equivalents and \$732M in total assets.

The Houston-based company also confirmed it had completed its site preparation and issued a limited notice to proceed to US LNG plant engineer Bechtel to begin construction of the Driftwood export facility.

“Tellurian’s own natural gas production and sales provide valuable operating cash and a unique advantage to us as a liquefied natural gas supplier,” said President and CEO Octávio Simões in the first-quarter 2022 earnings statement.

The Driftwood plant has permits to produce 27.6 million tonnes per annum of LNG and has 10-year offtake agreements with Shell North America and global commodities firms Vitol and Gunvor.

The Tellurian project involves constructing 20 mid-scale processing Trains, each with 1.38 MTPA of capacity, and built as five blocks of four Trains.

The Phase One development would include the first two of these blocks with 11 MTPA of output and two of three planned 235,000 cubic metres storage tanks and the first of three planned loading berths for LNG carriers.

“We are nearing net production of 100 million cubic feet equivalent per day and plan to reach 200 mmcf per day by year-end,” added Simões.

“Tellurian production is now generating free cash flow after capex and we intend to maintain capex at approximately \$150M a year,” explained the CEO.

“With Bechtel now onsite beginning construction of Driftwood, we are on schedule to begin LNG production in 2026,” he stated.

Tellurian produced 6.1 billion cubic feet of natural gas for the quarter to the end of March compared with 4.9 Bcf for the previous quarter.

Tellurian’s upstream assets include 13,521 net acres and interests in 82 producing wells as of March 2022. ■



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LNG Import Terminals

Explanatory Notes

- The tables do not include the following types of LNG facilities :
 - ◆ Small marine satellite terminals receiving LNG from liquefaction plants in their own country (such as exist in Norway) or which receive LNG transhipped from nearby reception terminals in their own country (such as in Japan)
 - ◆ Satellite LNG storage facilities that receive LNG transported only by road or rail
- Expansions of LNG reception terminals are only shown if they involve new storage tanks
- Where there is a blank in the table the information is uncertain or unknown.

Any comments on the tables, and corrections / additional information from terminal shareholders and project developers would be most welcome, and should be sent to editor@lngjournal.com

Country	Location (Project)	Owners	Start up	Storage	
				Tanks	Capacity
Belgium	Zeebrugge	Fluxys	1987	4	380,000
Canada	Canaport Saint John	Irving Oil, Repsol	2009	3	480,000
Chile	Quintero	ENAP, Metrogas, Enagas	2009	3	334,000
	Mejillones	Engie, Ameris Capital AGF	2010	1	175,000
China	Beihai LNG, Guangxi	Sinopec	2015	4	640,000
	Dalian	PetroChina	2011	3	480,000
	Dapeng ND Guangdong	CNOOC	2018	4	640,000
	Dongguan, Guangdong	Jovo Group	2013	2	160 000
	Fujian LNG (Xiuyu)	CNOOC, Fujian I&D Corp.	2008	2	640,000
	Guangdong	CNOOC,BP	2006	3	480,000
	Haikou, Hainan LNG	CNOOC	2014	3	480,000
	Ningbo, Zhejiang	CNOOC, Zhejiang Energy	2012	3	480,000
	Qidong, Jiangsu	Guanghui Energy	2018	1	60,000
	Qingdao, Shandong	Sinopec	2014	3	480,000
	Rudong	PetroChina	2011	3	530,000
	Shanghai	CNOOC, Shenergy Group	2009	3	495,000
	Shanghai, Mengtougou	Shanghai Gas	2008	3	120 000
	Shenzen, Diefu	CNOOC	2016	2	320,000
	Tangshan, Hebei	PetroChina	2013	3	480,000
	Tianjin North	Sinopec	2017	2	320,000
	Yuedong, Guangdong	CNOOC	2016	2	320,000
	Zhoushan Zhejiang	Enn Group	2018	2	320,000
	Zhuhai, Gaolan	CNOOC	2013	3	480,000
Dominican Republic	Punta Caucedo	AES Andres	2003	1	160 000
Finland	Pori	Gasum Skangas	2016	1	30,000
	Tornio	Gasum Skangas	2018	1	30,000
France	Fos Tonkin	Elengy	1972	3	150,000
	Montoir-de-Bretagne	Elengy	1980	3	360,000
	Fos Cavaou	Engie, Total	2010	3	330,000
	Dunkirk LNG	EDF, Fluxys, Total	2016	3	570,000
Gibraltar	Gasnor	Shell	2018	1	5,000
Greece	Revithoussa	DEPA	2000	3	225,000
India	Dabhol	GAIL, NTPC (Ratnagiri Gas & Power)	2009	3	480,000
	Dahej	Petronet LNG	2004	4	592,000
	Hazira	Shell India, Total	2005	2	320,000
	Kochi, Kerala	Petronet LNG	2013	2	320,000
	Mundra	Gujarat State Petroleum, Adani Group	2018	2	320,000
	Kamarajar (Ennore), Tamil Nadu	Indian Oil, DFC, ICICI Bank	2019	2	360,000
Indonesia	Arun	Pertamina	2015	5	507,000
Italy	Panigaglia	Snam	1969	2	100,000
	Porto Levante (offshore GBS)	ExxonMobil, Qatar Petroleum, Edison Gas	2009	2	250,000
Jamaica	Montego Bay	New Fortress	2018	1	7,000
Japan	Negishi	Tokyo Gas	1969	14	1,180,000
	Sodegaura	Tokyo Gas JERA Co. Inc	1973	35	2,660,000
	Ohgishima	Tokyo Gas	1998	4	850,000
	Higashi-Ohgishima	JERA Co. Inc.	1984	9	540,000
	Futtsu	JERA Co. Inc.	1985	10	1,360,000
	Yokkaichi LNG	JERA Co. Inc.	1988	4	320,000
	Kawagoe	JERA Co. Inc.	1997	6	840,000
	Yokkaichi Works	Toho Gas	1991	2	160,000
	Chita LNG Joint	Toho Gas, Chubu Electric	1978	4	300,000
	Chita LNG	Toho Gas, Chubu Electric	1983	7	640,000
	Chita - Midorihama	Toho Gas	2001	3	600,000
	Senboku I	Osaka Gas	1972	4	180,000
	Senboku II	Osaka Gas	1977	18	1,585,000
	Himeji	Osaka Gas	1984	8	740,000
	Himeji LNG	Kansai Electric	1979	7	520,000
	Yanai	Chugoku Electric	1990	6	480,000
	Niigata	Nihonkai LNG, Tohoku Electric	1984	8	720,000
	Oita	Oita Gas, Kyushu Electric	1990	5	460,000
	Tobata	Kitakyushu LNG	1977	8	480,000
	Fukuoka	Saibu Gas	1993	2	70,000
	Sodeshi	Shizuoka Gas	1996	3	337,200
	Hatsukaichi	Hiroshima Gas	1996	2	170,000
	Kagoshima	Nippon Gas	1996	2	136,000
	Shin-Minato	Sendai City Gas	1997	1	80,000
	Nagasaki	Saibu Gas	2003	1	36,000
	Sakai	Kansai Electric, Cosmo Oil	2006	3	420,000
	Mizushima	Nippon Oil, Chugoku Electric	2006	2	320,000

LNG Import Terminals (continued)

Country	Location (Project)	Owners	Start up	Storage	
				Tanks	Capacity
Japan (continued)	Sakaide	Shikoku Electric, Cosmo Oil	2011	1	180,000
	Ishikari LNG	Hokkaido Gas, Hokkaido Electric	2012	2	380,000
	Okinawa	Okinawa Electric Power	2012	2	280,000
	Naoetsu	Inpex	2013	2	360,000
	Joetsu	JERA Co. Inc.	2011	3	540,000
	Hachinohe LNG	Nippon Oil	2015	2	280,000
	Hitachi LNG	Tokyo Gas	2015	1	230,000
Korea	Soma Fukushima	Japan Petroleum Exploration	2017	1	225,000
	Boryeong	GS Energy, SK E&S	2017	3	200,000
	Incheon	Kogas	1996	20	2,880,000
	Kwangyang	POSCO SK E&S	2005	4	530,000
	Pyeong-Taek	Kogas	1986	23	3,360,000
	Samcheok	Kogas	2014	3	600,000
	Tong-Yeong	Kogas	2002	17	2,620,000
	Jeju	Kogas	2019	2	90,000
Kuwait	Al Zour LNG	KIPIC	2021	8	1,800,000
Malaysia	Pengerang Johor	Petronas Gas	2017	2	400,000
Mexico	Altamira	Vopak, Enagas	2006	2	300,000
	Energia Costa Azul	Sempre LNG	2008	2	320,000
	Manzanillo	Samsung, Kogas, Mitsui	2012	2	300,000
Netherlands	Gate LNG	Gasunie, Royal Vopak	2011	3	540,000
Panama	Costa Norte	AES	2018	1	130,000
Philippines	Pagbilao LNG	Energy World Corp.	2017	1	130,000
Poland	Swinoujscie	Baltic Gaz System	2015	2	320,000
Portugal	Sines	REN Atlantico	2004	3	390,000
Puerto Rico	Penuelas	EcoElectrica	2000	1	160,000
Singapore	Singapore	Singapore Energy Authority	2013	3	540,000
Spain	Barcelona	Enagas	1969	8	840,000
	Huelva	Enagas	1988	5	610,000
	Cartagena	Enagas	1989	5	587,000
	Bilbao	Enagas, EVE	2003	3	450,000
	Sagunto	GNF, Osaka Gas, Oman Oil	2006	4	600,000
	Mugardos, El Ferrol	Reganosa, Sonatrach, Sojitz Corp.	2006	2	300,000
	El Musel, Gijón,	Enagas	2013	2	300,000
Sweden	Lysekil	Gasum	2014	1	30,000
	Nynashamn	AGA Gas	2011	1	20,000
Taiwan	Yung-An	CPC	1990	6	690,000
	Tai-Chung	CPC	2009	5	800,000
Thailand	Map Ta Phut	PTT LNG	2011	2	320,000
Turkey	Marmara Ereglisi	Botas	1994	3	255,000
	Izmir	EgeGaz	2006	2	280,000
USA	Everett	Suez LNG NA	1971	2	155,000
	Lake Charles	Shell, ETE	1982	4	425,000
	Freeport	Freeport LNG Development	2008	2	320,000
	Golden Pass, TX	Qatar Petroleum, ExxonMobil	2010	5	775,000
	Pascagoula, MS	Gulf LNG, Kinder	2012	2	320,000
UK	Isle of Grain	National Grid	2005	8	1,000,000
	South Hook	ExxonMobil, Qatar Petroleum, Total	2009	5	775,000
	Dragon LNG, Milford Haven	Shell, Petronas	2009	2	310,000

LNG Import Terminal Projects

Country	Location/Project	Owners/Project Developers	Start up	Storage	
				Tanks	Capacity
China	Shenzhen	CNPC Yudean Power	2021	2	120,000
	Tianjin (Nangang)	Beijing Energy	2022	10	2,000,000
	Yangjiang	CNPC Yudean Power	2023	2	120,000
	Zhangzhou Fujian	CNOOC	2022	2	160,000
India	Dhamra Odisha	Indian Oil, Adani, GAIL	2020	2	320,000
	Jaigarh	Hiranandani Group	2021	2	320,000
	Kodinar	Hindustan Petroleum Corp.	2022	1	160,000
Japan	Himuka	Diagas Group-Osaka Gas	2022	1	65,000

LNG FSRU Import Facilities

Country	Location (Project)	Owners	Start up
Argentina	Escobar GasPort	Excelerate/Enarsa	2011
Bangladesh	Moheshkhali	Excelerate, PetroBangla	2018
	Cox's Bazar	Summit Power International, Excelerate Energy	2019
Brazil	Pecem, FSRU	Petrobras	2009
	Guanabara Bay FSRU	Petrobras	2009
	Salvador, Bahia FSRU	Petrobras	2013
	Porto Sergipe FSRU	Golar LNG/Stonepeak	2020
	Porto do Acu FSRU	GNA	2020
China	Tianjin FSRU	CNOOC, Hoegh, various	2013
Croatia	Hrvatska LNG	Hrvatska Elektroprivreda Plc, Plinacro Ltd	2021
Colombia	Cartagena FSRU	Promigas, Sociedad Portuaria El Cayao	2016
Egypt	Ain Sokhna, Suez	EGAS, BW Gas	2015
Ghana	Tema LNG	Helios/GNPC	2021
Indonesia	Lampung	Hoegh LNG, PGN LNG	2014
	Nusantara (Jakarta Bay)	Golar LNG, Pertamina	2012
	Benoa LNG	PT Pertagas Niaga	2016
	Amurang	Karadeniz	2020
	Jawa Satu FSRU	Pertamina	2021
Israel	Hadera Gateway	Israel Electric	2013
Italy	Livorno	OLT Offshore LNG Toscana	2013
Jamaica	Old Harbour	Golar FSRU, New Fortress	2019
Jordan	Aqaba, Jordan	Golar LNG	2015
Kuwait	Mina Al-Ahmadi	KPC	2009
Lithuania	Klaipeda	Klaipedos Nafta Hoegh LNG	2014
Malaysia	Malacca FSRU	Petronas	2012
Malta	FSU Armada Mediterrana	ElectroGas	2016
Myanmar	Thanlyin	CNTIC Vpower	2020
Pakistan	Port Qasim	Excelerate, Engro Corp	2015
	Port Qasim	BW-Mitsui, GGP Consortium	2017
Russia	Kaliningrad FSRU	Gazprom	2020
Turkey	Aliaga FSRU, Turquoise FLNG	Etki LNG	2016
	Dortyol FSRU Terminal	Botas	2018
UAE	Ruwais, Abu Dhabi	Gasco (UAE)	2016
	Jebel Ali Port, Dubai	DSA (UAE)	2010

LNG Export Projects

Country	Location/Project	Project Developers	Planned Start Up	Number of Trains	Capacity In MTPA
AUSTRALIA	Pluto LNG expansion	Woodside	2021+	2	10.0
CANADA	Bear Head LNG, Nova Scotia	LNG Ltd.	2024	4	8.0
	Goldboro LNG, Nova Scotia	Pieridae Energy	2024	2	10.0
	Kitimat LNG, BC	Woodside, Chevron	2024	2	10.0
	LNG Canada, BC	Shell, Mitsubishi, Kogas, PetroChina, Petronas	2024	2	12.0
	Kwispaa FLNG, Vancouver	Steelhead LNG	2024	4	12.0
	Vancouver Tilbury	WesPac Midstream	2021	1	3.25
	Woodfibre LNG, Squamish	Pacific Oil & Gas Co	2020	2	2.1
INDONESIA	Sengkang LNG	Energy World Corp.	2021+	4	2.0
MALAYSIA	Rotan FLNG (Sabah)	Petronas, Murphy Oil	2021	1	1.5
MOZAMBIQUE	Area 1 Onshore	Anadarko Petroleum and partners	2023+	2	10.0
	Area 4 Onshore	Eni and partners	2023+	2	10.0
	Area 4 FLNG	Eni and partners	2022	1	3.4
NIGERIA	NLNG Train 7	NNPC, Shell, Eni, Total	2022+	1	7.0
PAPUA NEW GUINEA	Elk-Antelope LNG	Total, ExxonMobil Oil Search, Petromin	Studies		
RUSSIA	Sakhalin II expansion	Gazprom, Shell, Mitsui, Mitsubishi	2021	studies	
	Vladisvostok LNG	Gazprom, Itochu, various	2023+	2	10.0
	Arctic LNG II Siberia	Novatek, Total	2023	3	19.8
USA	Alaska LNG Nikiski	Alaska Gasline Development Corp.	2023+	3	20.0
	Annova LNG, Brownsville	Exelon Corp.	2023+	6	6.0
	Commonwealth LNG, Louisiana	Commonwealth LNG LLP	2023+	8	9.0
	Delfin LNG, Louisiana	Delfin	2023+	3	9.0
	Driftwood LNG, Louisiana	Tellurian, Total and others	2023	6	27.6
	Galveston Bay LNG	NextDecade	2023+	6	27.0
	Golden Pass, Texas	Qatar Petroleum, ExxonMobil	2024	3	15.6
	Jacksonville, St John's River	Eagle LNG, Ferus Natural Gas Fuels	2021+	small	TBC
	Jordan Cove, Coos Bay	Pembina Corp.	2024	2	7.8
	Lake Charles, Louisiana	Shell, ETE	2024	3	15.0
	Magnolia LNG	Louisiana LNG Ltd.	2023+	4	8.0
	Port Arthur LNG	Sempre	2023+	2	10.0
	Rio Grande LNG	NextDecade	2023+	6	27.0
	Sabine Pass LNG, Louisiana	Cheniere	2016-19	1	4.5
	Texas LNG Brownsville	Chandra, Meyer, Samsung, others	2023+	2	4.0
	VG LNG (Cameron Parish)	Venture Global	2022	5	12.0
	VG LNG (Plaquemines)	Venture Global	2022	10	20.0
	VG LNG (Delta-Plaquemines)	Venture Global	2024	36	22.5

LNG Exporters

Country	Location/Project	Shareholders	Start up	Liquefaction		Storage	
				Trains	capacity (nominal) mtpa	No. of tanks	Total capacity m³
ABU DHABI (UAE)	Das Island (Adgas)	ADNOC, Mitsui, BP, Total	1977 1994	2 1	3.2 2.5	3	240,000
ALGERIA	Arzew	Sonatrach GL4Z	1964	3	1.1	3	35,000
	Arzew	Sonatrach GL1Z	1978	6	7.8	3	300,000
	Arzew	Sonatrach GL2Z	1980	6	8.0	3	300,000
	Arzew	Sonatrach	2014	1	4.7		
	Skikda	Sonatrach GL1K II	1980	3	3.0	5	308,000
	Skikda	Sonatrach (rebuild)	2013	1	4.5		
ANGOLA	Soyo	Sonangol, Chevron, BP, ENI, Total	2012	1	5.2	2	370,000
AUSTRALIA	Karratha	NWS Woodside, Shell, BHP	1989	2	5.0	4	260,000
		(BP, Chevron	1992	1	2.5	1	130,000
		(Mitsubishi/Mitsui)	2004	1	4.4	1	130,000
		NWS partners	2008	1	4.4	1	130,000
	Darwin	Darwin (Bayu Undan) ConocoPhillips, Santos, Eni, Inpex, TEPCO, Tokyo Gas	2006	1	3.5	1	188,000
	Australia Pacific LNG	ConocoPhillips, Origin Energy, Sinopec	2016	2	7.5	2	320,000
	Gladstone LNG	Santos, Petronas, Total, Kogas	2015	2	7.8	2	280,000
	Gorgon LNG	Chevron, Shell, ExxonMobil	2016	3	15.6	2	360,000
	Pluto LNG	Woodside, Tokyo Gas, Kansei	2012	1	4.8	2	240,000
	QCLNG	Shell, CNOOC	2014	2	8.0	2	280,000
	Wheatstone LNG	Chevron, Woodside, Kuwait (KUFPEC), Jera, Kyushu	2017	2	8.9	2	300,000
	Ichthys LNG	Inpex Corp., Total	2018	2	8.9	2	330,000
	Prelude FLNG	Shell, Inpex, Kogas CPC	2019	1	3.5		
BRUNEI	Lumut	Brunei/Shell/Mitsubishi/Total	1972-74	5	7.2	3	176,000
CAMEROON	Hilli Episeyo FLNG	Kribi Perenco	2018	1	1.2	1	125,000
EGYPT	Damietta	Union Fenosa, EGPC, EGAS	2004	1	5.0	2	300,000
	Idku	EGPC, EGAS, Shell, Total, Petronas	2005	2	7.2	2	280,000
EQ.GUINEA	Bioko Island	Marathon, Sonagas, Mitsui, Marubeni	2007	1	3.4	2	272,000
INDONESIA	Bontang I	Pertamina, VICO, JILCO, Total	1977	2	5.2	5	635,000
	Bontang II		1983	2	5.2		
	Bontang III		1989	1	2.8		
	Bontang IV		1993	1	2.8		
	Bontang V		1997	1	2.8		
	Bontang VI		1999	1	3.0		
	Sulawesi LNG	Medco Energi, Pertamina, Mitsubishi	2015	1	2.0	1	170,000
	Tangguh	BP, MI Berau, CNOOC, Nippon, LNG Japan	2008	2	7.6	2	340,000
MALAYSIA	Bintulu (MLNG Satu)	Petronas, Sarawak, Mitsubishi	1983	3	8.1	4	260,000
	Bintulu (MLNG Dua)	Petronas, Shell, Sarawak, Mitsubishi	1995	3	7.8	1	65,000
	Bintulu (MLNG Tiga)	Petronas, Shell, Sarawak, Mitsubishi, Nippon Oil	2003	2	6.8	1	120,000
	Bintulu Train 9	Petronas	2016	1	3.6		
	Kanowit FLNG	Petronas	2016	1	1.2		
NIGERIA	Bonny Island	NNPC, Shell, Total, Eni	1999	2	6.4	2	168,400
		Nigeria LNG (formed by above)	2002	1	3.2	1	84,200
		Nigeria LNG	2006	2	8.2		
		Nigeria LNG	2008	1	4.1	1	84,200
NORWAY	Snøhvit/Melkoya	Equinor, Total, Petoro	2007	1	4.2	2	280,000
OMAN	Oman LNG	Oman Govt., Shell, Total, Korea LNG	2000	2	7.1	2	240,000
		Mitsubishi, Mitsui, Partex and Itochu					
		Oman Govt., Oman LNG Union Fenosa, Osaka Gas, & Itochu	2006	1	3.7	2	240,000
PAPUA NEW GUINEA	PNG LNG	ExxonMobil, Oil Search, Santos, JX Nippon Oil	2014	2	6.9	2	320,000
PERU	Peru LNG	Hunt Oil, Shell, Marubeni, SK Group	2010	1	4.4	2	260,000
QATAR	Qatargas 1-T1&2	QP, ExxonMobil, Total, Marubeni, Mitsui	1997	2	6.4	4	340,000
	Qatargas 1-T3	QP, ExxonMobil, Total, Marubeni, Mitsui	1999	1	3.1		
	Qatargas II-T1	QP, ExxonMobil	2009	1	7.8		
	Qatargas II-T2	QP, ExxonMobil, Total	2009	1	7.8	8	1,160,000
	Qatargas III-T1	QP, ConocoPhillips, Mitsui	2010	1	7.8		
	Qatargas IV-T1	QP, Shell	2010	1	7.8		
	RasGas I- T1&2	QP, ExxonMobil, Kogas, Itochu, LNG Japan	1999	2	6.6		
	RasGas II- T3	QP, ExxonMobil	2004	1	4.7		
	RasGas II- T4	QP, ExxonMobil	2005	1	4.7	6	840,000
	RasGas II- T5	QP, ExxonMobil	2007	1	4.7		
	Rasgas III – T6	QP, ExxonMobil	2009	1	7.8		
	Rasgas III – T7	QP, ExxonMobil	2010	1	7.8		
RUSSIA	Sakhalin Island	(Sakhalin Energy) Gazprom, Shell, Mitsui, Mitsubishi	2009	2	9.6	2	200,000
	Yamal LNG Siberia	Novatek, Total, CNPC, Silk Fund	2017	3	16.5	4	640,000
TRINIDAD & TOBAGO	Point Fortin Train 1	BP, Shell, CIC, NGC	1999	1	3.0	2	204,000
	Train 2	BP, Shell	2002	1	3.3	1	160,000
	Train 3	BP, Shell	2003	1	3.3	1	160,000
	Train 4	BP, Shell, NGC	2005	1	5.2	1	160,000
USA	Cheniere Sabine Pass	Cheniere Energy	2016	5	22.5	5	800,000
	Cove Point LNG	Dominion Energy	2017	1	5.3	7	695,000
	Cheniere Corpus Christi	Texas Cheniere	2018	3	15.0	3	480,000
	Cameron Hackberry	Sempra, Total, Mitsui, Mitsubishi	2019	2	9.8	3	480,000
	Elba Island Georgia	Kinder Morgan, EIG Energy	2019	10	2.5	5	535,000
	Freeport LNG, Texas	Freeport LNG	2019	2	10.2	3	483,000
	Calcasieu Pass LNG	Venture Global	2022	18	11	2	400,000
YEMEN	Bal-Haf	Yemen LNG, Total, Yemen Gas, Hunt Oil, SK Group, Hyundai	2009	2	6.7	2	320,000

LNG OneWorld.com



World LNG Carrier Fleet

LNG Carrier	Capacity m ³	Registered Owner	Builder	Delivery	Flag	Power Plant	Cargo System	No. of Tanks	Original Project	Hull Number
Aamira	268,000	Nakilat SHI 1753 Inc.	Samsung	Apr-10	M. Islnds.	Diesel	TZ Mk. III	10	Qatargas IV	1753
Abadi	135,000	Tost Two (NBD) Sendirian Berhad	Mitsubishi	May-02	Brunei	Steam	Moss	5	Lumut	2163
Adam LNG	162,000	Oman Shipping Co.	HHI	Jul-14	Malta	Diesel	TZ Mk. III Flex	4	Oman LNG	2584
Adamastos	170,800	Shin Doun Kisen Co. Ltd.	HHI	Aug-21	Malta	X-DF	TZ Mk. III Flex	4	Portfolio	3109
Adriano Knutsen	180,000	Knutsen OAS Shipping	HHI	Jul-19	Spain	ME-GI	TZ Mk. III Flex	4	Corpus Christi	2963
Al Aamriya	210,168	J5 Nakilat No.1 Ltd.	Daewoo	May-08	M. Islnds.	Diesel	GT NO 96	5	RasGas III	2249
Al Areesh	148,786	Al Areesh LLC	Daewoo	Jan-07	Bahamas	Steam	GT NO 96	4	RasGas II	2239
Al Bahiya	210,100	Nakilat DSME 2286 Inc.	Daewoo	Dec-09	M. Islnds.	Diesel	GT NO 96	5	Qatargas IV	1726
Al Bidda	137,339	Mitsui O.S.K. Lines	Kawasaki	Nov-99	Japan	Steam	Moss	5	Qatargas I	1470
Al Daayen	148,853	Seaspirit Leasing	Daewoo	Mar-07	Bahamas	Steam	GT NO 96	4	RasGas II	2240
Al Dafna	268,000	Nakilat SHI 1726 Inc.	Samsung	Oct-09	M. Islnds.	Diesel	TZ Mk. III	10	RasGas	1726
Al Deebel	145,000	Peninsula LNG Transport No. 3	Samsung	Nov-05	Bahamas	Steam	TZ Mk. III	4	RasGas II	1442
Al Gattara	216,200	Overseas LNG H1 Corp.	HHI	Nov-07	M. Islnds.	Diesel	TZ Mk. III	4	Qatargas II	1791
Al Ghariya	210,150	Neptora Schiffsbetriebsgesellschaft mbH & Company ts Julia KG	Daewoo	Dec-07	Bahamas	Diesel	GT NO 96	4	Qatargas II	2248
Al Gharrafa	216,200	Overseas LNG H2 Corp.	HHI	Jan-08	M. Islnds.	Diesel	TZ Mk. III	5	Qatargas II	1792
Al Ghashamiya	217,591	Nakilat SHI 1696 Inc.	Samsung	Apr-09	M. Islnds.	Diesel	TZ Mk. III	10	Qatargas III	1696
Al Ghuwairiya	263,300	Nakilat Al Ghuwairiya Inc.	Daewoo	Dec-08	M. Islnds.	Diesel	GT NO 96	5	Qatargas II	2255
Al Hamla	216,200	Overseas LNG S2 Corp.	Samsung	Feb-08	M. Islnds.	Diesel	TZ Mk. III	4	Qatargas II	1606
Al Hamra	137,000	Al Hamra Ltd.	STX	Nov-96	Liberia	Steam	Moss	4	Das Island	1332
Al Huwaila	217,000	Al Huwaila Inc.	Samsung	May-08	Bahamas	Diesel	TZ Mk. III	10	RasGas III	1643
Al Jasra	137,227	Mitsui O.S.K. Lines	Mitsubishi	Jun-00	Japan	Steam	Moss	5	Qatargas I	2117
Al Jassasiya	145,700	Venice Maritime Inc.	Daewoo	May-07	Bermuda	Steam	GT NO 96	4	RasGas II	2243
Al Karaana	210,100	Nakilat DSME 2284 Inc.	Daewoo	Oct-09	M. Islnds.	Diesel	GT NO 96	4	Qatargas III	2284
Al Kharaitiyat	216,300	Nakilat HHI 1909 Inc.	HHI	Jun-09	M. Islnds.	Diesel	TZ Mk. III	4	Qatargas III	1909
Al Kharsaah	217,000	Al Kharsaah Inc.	Samsung	Jun-08	Bahamas	Diesel	TZ Mk. III	10	RasGas III	1644
Al Khatiya	210,150	Nakilat DSME 2283 Inc.	Daewoo	Jul-09	M. Islnds.	Diesel	GT NO 96	4	Qatargas IV	2283
Al Khaznah	135,496	Al Khaznah Inc.	Mitsui E&S	Jul-94	Liberia	Steam	Moss	5	Das Island	1390
Al Khor	137,354	Mitsui O.S.K. Lines	Mitsubishi	Nov-96	Japan	Steam	Moss	5	Qatargas I	2089
Al Khuwair	217,000	Al Khuwair Inc.	Samsung	Jun-08	Bahamas	Diesel	TZ Mk. III	10	RasGas III	1646
Al Mafyar	266,000	Nakilat SHI 1697 Inc.	Samsung	Apr-09	M. Islnds.	Diesel	TZ Mk. III	5	Qatargas III	1697
Al Marrouna	149,539	Seaspirit Leasing	Daewoo	Sep-06	Bahamas	Steam	GT NO 96	4	RasGas II	2238
Al Mayeda	266,000	Nakilat SHI 1694 Inc.	Samsung	Jan-09	M. Islnds.	Diesel	TZ Mk. III	5	Qatargas III	1694
Al Nuaman	210,100	Nakilat DSME 2285 Inc.	Daewoo	Dec-09	M. Islnds.	Diesel	GT NO 96	4	Qatargas III	2286
Al Oraiq	210,200	J5 Nakilat No.3 Ltd.	Daewoo	Jun-08	M. Islnds.	Diesel	GT NO 96	18	RasGas III	2250
Al Rayyan	137,420	Mitsui O.S.K. Lines	Kawasaki	Mar-97	Japan	Steam	Moss	5	Qatargas I	1445
Al Rekayyat	216,293	Nakilat HHI 1910 Inc.	HHI	Jun-09	M. Islnds.	Diesel	TZ Mk. III	4	Qatargas III	1910
Al Ruwais	210,150	Neptana Schiffsbetriebsgesellschaft mbH & Company ts Alexandra KG	Daewoo	Aug-07	Bahamas	Diesel	GT NO 96	4	Qatargas II	2245
Al Sadd	210,200	Nakilat DSME 2265 Inc.	Daewoo	Mar-09	M. Islnds.	Diesel	GT NO 96	12	Qatargas III	2265
Al Safliya	210,150	Nausola Schiffsbetriebsgesellschaft mbH & Company ts Britta KG	Daewoo	Sep-07	Bahamas	Diesel	GT NO 96	5	Qatargas II	2246
Al Sahla	216,200	J5 Nakilat No.5 Ltd.	HHI	Jun-08	M. Islnds.	Diesel	TZ Mk. III	4	RasGas III	1863
Al Samriya	263,300	Nakilat Al Samriya Inc.	Daewoo	Feb-09	M. Islnds.	Diesel	GT NO 96	5	Qatargas II	2257
Al Shamal	217,000	Al Shamal Inc.	Samsung	Apr-08	Bahamas	Diesel	TZ Mk. III	10	RasGas III	1645
Al Sheehaniya	210,100	Nakilat DSME 2264 Inc.	Daewoo	Feb-09	M. Islnds.	Diesel	GT NO 96	12	Qatargas III	2264
Al Thakhira	145,000	Peninsula LNG Transport No. 2	Samsung	Aug-05	Bahamas	Steam	TZ Mk. III	4	RasGas II	1441
Al Thumama	216,200	J5 Nakilat No.2 Ltd.	HHI	Feb-08	M. Islnds.	Diesel	TZ Mk. III	4	RasGas III	1862
Al Utouriya	215,000	J5 Nakilat No.8 Ltd.	HHI	Sep-08	M. Islnds.	Diesel	TZ Mk. III	4	RasGas III	1875
Al Wajbah	137,308	Mitsui O.S.K. Lines	Mitsubishi	Jun-97	Japan	Steam	Moss	5	Qatargas I	2090
Al Wakrah	137,371	Mitsui O.S.K. Lines	Kawasaki	Nov-98	Japan	Steam	Moss	5	Qatargas I	1446
Al Zubarah	137,573	Mitsui O.S.K. Lines	Mitsui E&S	Nov-96	Japan	Steam	Moss	5	Qatargas I	1411
Alto Acrux	147,798	Bahamas LNG Shipping	Mitsubishi	Mar-08	Bahamas	Steam	Moss	4	Darwin LNG	2219
Amadi	154,800	Brunei Gas Carriers	HHI	Jul-15	Brunei	Steam	TZ Mk. III	4	Lumut	2607
Amali	148,000	BGC SPV NBD	Daewoo	Aug-11	Brunei	Steam	GT NO 96	4	Lumut	2277
Amani	154,800	Brunei Gas Carriers	HHI	Oct-14	Brunei	Steam	TZ Mk. III	4	Lumut	H2606
Amberjack LNG	174,000	LNGShips	HHI	Apr-20	Malta	X-DF	TZ MK. III Flex	–	Portfolio	3021
Amur River	149,700	Seacrown Maritime	HHI	Nov-07	M. Islnds.	Steam	TZ Mk. III	4	Sakhalin II	1734
Arctic Aurora	155,000	Fareastern Shipping	HHI	Jul-14	M. Islnds.	Diesel/Gas-Electric	TZ Mk. III	4	Snøhvit LNG	2580
Arctic Discoverer	142,612	Northern LNG Transport II Company S.A.	Mitsui E&S	Feb-06	Bahamas	–	Moss	4	Hammerfest	1564
Arctic Lady	147,200	Leif Hoegh (UK) Ltd.	Mitsubishi	Apr-06	Norway	Steam	Moss	4	Hammerfest	2185
Arctic Princess	147,200	R.B. Quadrangle Leasing	Mitsubishi	Jan-06	Norway	Steam	Moss	4	Hammerfest	2184
Arctic Spirit	89,800	Artic Spirit LLC	Ishikawajima	Dec-93	Liberia	Steam	IHI SPB	4	Atlantic LNG	3016
Arctic Voyager	142,759	Lloyds TSB Equipment Leasing (No.1)	Kawasaki	Jul-06	Bahamas	Steam	Moss	4	Hammerfest	1532
Aristarchos	174,000	Dias Gas Carrier Corp.	HHI	Jun-21	Malta	X-DF	TZ Mk. III Flex	4	Portfolio	3107

Aristidis I	174,000	Atrotos Gas Carrier Corp.	HHI	Jan-21	Malta	X-DF	TZ Mk. III Flex	4	Portfolio	3106
Aristos I	174,000	Xiang Ch25 HK International	HHI	Nov-20	Malta	X-DF	TZ Mk. III Flex	4	Portfolio	3105
Arkat	148,000	BGC SPV NBD	Daewoo	Feb-11	Brunei	–	GT NO 96	4	Lumut	2273
Arwa Spirit	165,500	Membrane Shipping	Samsung	Aug-08	M. Islnds.	Diesel/Gas-Electric	TZ Mk. III	4	Balhaf	1625
Aseem	155,003	India LNG Transport Company No.3 S.A.	Samsung	Nov-09	Malta	Diesel	TZ Mk. III	4	RasGas	1686
Asia Endeavour	154,948	Chevron Global Technology Services Co.	Samsung	Jun-15	Bahamas	Diesel/Gas-Electric	TZ MK. III	4	Gorgon	1942
Asia Energy	154,948	Chevron Global Technology Services Co.	Samsung	Oct-14	Bahamas	Diesel/Gas-Electric	TZ MK. III	4	Gorgon	1921
Asia Excellence	154,948	Chevron Global Technology Services Co.	Samsung	Jan-15	Bahamas	Diesel/Gas-Electric	TZ MK. III	4	Gorgon	1941
Asia Integrity	154,948	Chevron Global Technology Services Co.	Samsung	Feb-17	Bahamas	Diesel/Gas-Electric	TZ Mk. III	4	Wheatstone	2069
Asia Venture	154,948	Chevron Global Technology Services Co.	Samsung	Jul-17	Bahamas	Diesel/Gas-Electric	TZ Mk. III	4	Wheatstone	2070
Asia Vision	154,948	Chevron Global Technology Services Co.	Samsung	Jul-14	Bahamas	Diesel/Gas-Electric	TZ MK. III	4	Gorgon	1920
Asklipios	170,816	Sea 199 Leasing Co Ltd.	HHI	Sep-21	Malta	X-DF	TZ Mk. III Flex	4	Portfolio	3110
Attalos	170,800	Sea 200 Leasing Co. Ltd.	HHI	Aug-21	Malta	X-DF	TZ Mk. III Flex	4	–	3108
Barcelona Knutsen	173,400	Norspan LNG V AS	Daewoo	Jan-10	Spain	Diesel/Gas-Electric	GT NO 96	4	Portfolio	2267
Beidou Star	172,000	Mitsui O.S.K. Lines	Hudong Zhonghua	Sep-15	H.K., China	Diesel	GT NO 96	4	PNG LNG	H1672A
Berge Arzew	138,088	Sonatrach Berge Arzew Corp.	Daewoo	Jul-04	Norway	Steam	GT NO 96	4	Arzew	2217
Bilbao Knutsen	138,000	Norspan LNG AS	Izar	Jan-04	Spain	Steam	GT NO 96	4	Portfolio	321
Bishu Maru	164,700	"K" Line - Kawasaki Kisen Kaisha	Kawasaki	Dec-17	Panama	TFDE	Moss	4	Wheatstone	1713
Bonito LNG	174,000	LNGShips	HHI	May-20	Malta	X-DF	TZ MK. III Flex	4	–	3022
Boris Davydov	172,410	Arctic LNG 4 Ltd.	Daewoo	Dec-18	Cyprus	TFDE - Azipod	GT NO 96 GW	4	Yamal	2428
Boris Vilkitsky	172,410	Arctic LNG 1 Ltd.	Daewoo	Jun-17	Cyprus	TFDE - Azipod	GT NO 96 GW	4	Yamal	2421
British Achiever	173,644	BP	Daewoo	Nov-18	Isle of Man	ME-GI	GT NO 96 GW	4	Freeport	2442
British Contributor	173,644	BP	Daewoo	Dec-18	Isle of Man	ME-GI	GT NO 96 GW	4	Freeport	2443
British Listener	173,644	BP	Daewoo	Jan-19	Isle of Man	ME-GI	GT NO 96 GW	4	Freeport	2444
British Mentor	173,644	BP	Daewoo	Mar-19	Isle of Man	ME-GI	GT NO 96 GW	4	Freeport	2445
British Partner	173,400	BP	Daewoo	Jun-18	Isle of Man	ME-GI	GT NO 96 GW	4	Freeport	2441
British Sapphire	155,000	RBSSAF (19) Ltd.	HHI	Jun-08	Isle of Man	Diesel/Gas-Electric	TZ Mk. III	4	Portfolio	1779
British Sponsor	173,644	BP	Daewoo	May-19	Isle of Man	ME-GI	GT NO 96 GW	4	Freeport	2446
Broog	137,529	Mitsui O.S.K. Lines	Mitsui E&S	Apr-98	Japan	Steam	Moss	5	Qatargas I	1412
Bu Samra	266,000	Nakilat Bu Samra Inc.	Samsung	Dec-08	M. Islnds.	–	TZ Mk. III	5	Qatargas II	1677
Bushu Maru	180,000	Mitsui O.S.K. Lines	Mitsubishi	Jul-19	Bahamas	Reheat Steam Turbine	TZ MK. III Flex	4	Sabine Pass	2327
BW Boston	138,059	Partrederiet BW Gas GDF Suez EMT DA	Daewoo	Jan-03	Norway	Steam	GT NO 96	4	Atlantic LNG	2207
BW Brussels	162,400	Ines LNG	Daewoo	Aug-09	Bermuda	Diesel/Gas-Electric	GT NO 96	4	Balhaf	2259
BW Everett	138,028	BW Gas SLNG	Daewoo	Jun-03	Norway	Steam	GT NO 96	4	Atlantic LNG	2212
BW Helios	174,000	Selene Navigation Pte Ltd.	Daewoo	May-21	Bermuda	ME-GI	GT NO 96 GW	4	–	2497
BW Lesmes	174,000	BW Gas AS	Daewoo	Mar-21	Bermuda	ME-GI	GT NO 96 GW	4	–	2496
BW Lilac	173,400	BW Maritime	Daewoo	Mar-18	Isle of Man	ME-GI	GT NO 96 GW	4	–	2436
BW Magna	173,000	BW Group	Daewoo	Mar-19	Singapore	ME-GI	GT NO 96	4	–	2488
BW Magnolia	173,400	Helen Navigation Pte Ltd.	Daewoo	Feb-20	Singapore	ME-GI	GT NO 96 GW	–	–	2490
BW Paris	162,400	SNC Elias	Daewoo	Jul-09	Bermuda	Diesel/Gas-Electric	GT NO 96	4	Balhaf	2258
BW Pavilion Aranda	173,400	BW Group	Daewoo	Sep-19	Singapore	ME-GI	GT NO 96 GW	4	Portfolio	2489
BW Pavilion Aranthera	173,400	BW Diamond LNG Pte Ltd.	Daewoo	Jul-20	Singapore	ME-GI	GT NO 96 GW	4	Portfolio	2491
BW Pavilion Leeara	158,629	BW LPG FPSOI	HHI	Jun-15	Singapore	Diesel/Gas-Electric	TZ Mk. III Flex	4	Portfolio	2572
BW Pavilion Vanda	155,000	BW LPG FPSOI	HHI	Feb-15	Singapore	DFDS	TZ Mk. III Flex	4	Portfolio	2571
BW Tatiana	135,269	Shell Tankers Singapore	Mitsubishi	Dec-02	Singapore	Steam	Moss	5	Atlantic LNG	2173
BW Tulip	173,400	BW Maritime	Daewoo	Dec-17	Singapore	ME-GI	GT NO 96 GW	4	–	2435
Cadiz Knutsen	138,826	Norspan LNG II AS	Navantia	Apr-04	Spain	Steam	GT NO 96	4	Portfolio	103
Cape Ann	145,130	SRV Joint Gas Two Ltd.	Samsung	Apr-10	Norway	Diesel/Gas-Electric	TZ Mk. III	4	Jaigarh LNG	1689
Castillo de Caldelas	176,300	Empresa Naviera Elcano	Imabari Shipbuilding	Jun-18	Malta	ME-GI	TZ Mk. III Flex	–	Portfolio	8188
Castillo De Merida	176,300	Empresa Naviera Elcano	Imabari Shipbuilding	Mar-18	Spain	ME-GI	TZ MK. III Flex	4	Portfolio	8177
Castillo de Santisteban	170,000	Naviera Trans Gas AIE	STX	Jun-10	Malta	Diesel Electric	GT NO 96	4	Portfolio	3008
Castillo de Villalba	138,000	Empresa Naviera Elcano	Navantia Cadiz	Sep-03	Spain	Steam	GT NO 96	4	Portfolio	87
Catalunya Spirit	138,000	Teekay Shipping Spain S.L.	Izar	Jun-03	Spain	Steam	GT NO 96	4	Atlantic LNG	319
Celsius Canberra	180,000	Xiang CH27 HK International	Samsung	Jan-21	Marshall Isl.	X-DF	TZ Mk. III Flex	4	US Portfolio	2298
Celsius Carolina	180,000	Oriental Fleet LNG 03 Ltd.	Samsung	Aug-21	Marshall Isl.	X-DF	TZ Mk. III Flex	4	US Portfolio	2314
Celsius Charlotte	180,000	Xiang CH28 HK International	Samsung	Jun-21	Marshall Isl.	X-DF	TZ Mk. III Flex	4	US Portfolio	2313
Celsius Copenhagen	180,000	Greenheart Gas Shipco I LLC	Samsung	Nov-20	Bermuda	X-DF	TZ Mk. III Flex	4	Portfolio	2297
CESI Beihai	174,000	COSCO Shipping Energy Transportation Co.	Hudong Zhonghua	Jun-17	H.K., China	DFDS	GT NO 96	4	APLNG	1717A
CESI Gladstone	174,000	China Shipping Co.	Hudong Zhonghua	Oct-16	H.K., China	–	GT NO 96	4	APLNG	1715A
CESI LianYungAng	174,000	COSCO Shipping Energy Transportation Co.	Hudong Zhonghua	Jun-18	H.K., China	Diesel-Electric	GT NO 96	4	APLNG	1720A
CESI Qingdao	174,000	China Shipping Co.	Hudong Zhonghua	Feb-17	H.K., China	DFDS	GT NO 96	4	APLNG	1716A
CESI Tianjin	174,000	COSCO Shipping Energy Transportation Co.	Hudong Zhonghua	Jul-17	China	TFDE	GT NO 96	4	APLNG	1718A

CESI Wenzhou	174,000	COSCO Shipping Energy Transportation Co.	Hudong Zhonghua	Feb-18	China	Diesel-Electric	GT NO 96	4	APLNG	1719A
Cheikh Bouamama	75,558	Skikda LNG Transport Corp.	Universal SB	Jul-08	Liberia	Steam	TZ Mk. III	4	Arzew/Skikda	88
Cheikh el Mokrani	75,759	Mediterranean LNG Transport Corp.	Japan Marine United	Jun-07	Liberia	Steam	TZ Mk. III	4	Skikda	55
Christophe De Margerie	170,000	DY Shipping Limited	Daewoo	Nov-16	Russia	Diesel/Gas-Electric	GT NO 96 GW	–	Yamal	2418
Clean Cajun	180,000	Platia Shipping Ltd.	HHI	May-22	Panama	X-DF	Membrane	4	–	3137
Clean Energy	149,700	Pegasus Shipholding	HHI	Mar-07	M. Islnds.	Steam	TZ Mk. III	4	Portfolio	1748
Clean Horizon	162,000	Dynagas	HHI	Apr-15	Malta	Diesel/Gas-Electric	TZ Mk. III Flex	4	Portfolio	2566
Clean Ocean	162,000	Dynagas	HHI	May-14	M. Islnds.	Diesel/Gas-Electric	TZ Mk. III Flex	4	Sabine Pass	2558
Clean Planet	162,000	Dynacom Tankers Management	HHI	Aug-14	M. Islnds.	Diesel Electric	TZ Mk. III Flex	4	Yamal	H2565
Clean Vision	162,000	Olinda	HHI	Aug-15	Malta	Diesel/Gas-Electric	TZ Mk. III Flex	4	Portfolio	2567
CNTIC VPower Energy	127,500	Shell Tankers Australia	Mitsubishi	Jan-92	Bermuda	Steam	Moss	4	North West Shelf	2041
Cobia LNG	174,000	Cardiff LNG ETA Owning LLC	HHI	Feb-21	Malta	X-DF	TZ Mk. III Flex	4	–	3038
Cool Discoverer	174,000	Serendipity Maritime Ltd.	HHI	Sep-20	Greece	X-DF	TZ MK. III Flex	4	Portfolio	S970
Cool Explorer	160,000	Thenamaris Ships Management Inc.	Samsung	Jan-15	Malta	DFDS	TZ Mk. III Flex	4	Spot	2049
Cool Racer	174,000	Eloquent Shipping Ltd.	HHI	Feb-21	Malta	X-DF	TZ Mk. III Flex	4	Portfolio	3126
Cool Runner	160,000	Thenamaris Ships Management Inc.	Samsung	Mar-14	Malta	Diesel Electric	TZ Mk. III Flex	4	Wheatstone	H2046
Cool Voyager	160,000	Energy Shipping & Trading	Samsung	Oct-13	Malta	TFDE	TZ Mk. III Flex	4	Wheatstone	–
Corcovado LNG	160,162	Drytank	Daewoo	Apr-14	Malta	Diesel Electric	GT NO 96 L03	4	Spot	H2297
Creole Spirit	173,400	Teekay LNG Partners	Daewoo	Feb-16	Bahamas	ME-GI	GT NO 96 GW	–	Sabine Pass	2407
Cubal	160,276	Mint LNG IV	Samsung	Jan-12	Bahamas	–	TZ Mk. III	4	Soyo	1813
Cygnus Passage	145,400	Cygnus LNG Shipping	Mitsubishi	Jan-09	Panama	Steam	Moss	4	Sakhalin II	2235
Dapeng Moon	147,200	Yue Gang LNG Ship Management Co.	Hudong Zhonghua	Jul-08	H.K., China	Steam	GT NO 96	4	Pluto	1309
Dapeng Star	147,210	Yue Peng LNG Shipping Co.	Hudong Zhonghua	Nov-09	H.K., China	Steam	GT NO 96	4	Pluto	1379
Dapeng Sun	147,200	Yue Peng LNG Shipping Co.	Hudong Zhonghua	Apr-08	H.K., China	Steam	GT NO 96	4	North West Shelf	1308
Diamond Gas Crystal	174,000	Diamond LNG Shipping 5 Pte Ltd.	Hyundai Samho	Jun-21	Singapore	X-DF	TZ Mk. III Flex	4	–	8030
Diamond Gas Metropolis	174,000	Diamond LNG Shipping 4 Ltd.	HHI	Nov-20	Bahamas	X-DF	TZ Mk. III Flex	4	Portfolio	8029
Diamond Gas Orchid	165,000	NYK Line	Mitsubishi	Jun-18	Japan	STaGE	Sayaringo	4	Cameron	2325
Diamond Gas Rose	165,000	NYK Line	Mitsubishi	Aug-18	Bahamas	STaGE	Sayaringo	4	Cameron	2325
Diamond Gas Sakura	165,000	Tokyo Gas	Japan Marine United	May-19	Panama	STaGE	Sayaringo	4	Cameron	2332
Diamond Gas Victoria	174,000	Diamond LNG Shipping 6 Pte Ltd.	Hyundai Samho	Jun-21	Bahamas	X-DF	TZ MK. III Flex	4	–	8031
Disha	136,025	India LNG Transport Company No.1 Ltd.	Daewoo	Dec-03	Malta	Gas Turbine	GT NO 96	4	RasGas	2210
Doha	137,262	Mitsui O.S.K. Lines	Mitsubishi	Jun-99	Japan	Steam	Moss	5	Qatargas I	2091
Dorado LNG	174,000	Hai Kuo Shipping 2052G Ltd.	Samsung	Dec-20	Malta	X-DF	TZ Mk. III Flex	4	Portfolio	2276
Duhail	210,150	Nauranto Schiffsbetriebsgesellschaft mbH & Company ts Gabriela KG	Daewoo	Dec-07	Bahamas	Diesel	GT NO 96	4	Qatargas II	2247
Dukhan	137,661	Qatar LNG Transport	Mitsui E&S	Sep-04	Liberia	Steam	Moss	5	Qatargas II	1561
East Energy	122,255	Bonny Gas Transport	STX	Aug-82	Bermuda	Steam	Membrane	4	NLNG	26B
Eduard Toll	172,410	Teekay Corp.	Daewoo	Sep-17	Bahamas	TFDE - Azipod	GT NO 96 GW	4	Yamal	2423
Ejnan	145,000	Peninsula LNG Transport No. 3	Samsung	Jan-07	Bahamas	Steam	TZ Mk. III	4	RasGas II	1594
Ekaputra 1	136,400	Cometco Shipping Inc.	Mitsubishi	Jan-89	Liberia	Steam	Moss	5	Bontang	2011
Elisa Aquila	174,000	Caroline 82 SASU	Hyundai Samho	04/03/2022	France	X-DF	TZ Mk. III Flex	4	Portfolio	S917
Elisa Larus	174,000	Caroline 77 SASU	Hyundai Samho	May-20	France	X-DF	TZ Mk. III Flex	4	Portfolio	S970
Energy Advance	147,624	Tokyo LNG Tanker Co. & Toho LNG Shipping Co.	Kawasaki	Mar-05	Japan	Steam	Moss	4	Portfolio	1521
Energy Atlantic	156,000	Alpha Tankers	STX	Sep-15	Greece	TFDE	GT NO 96 L03	4	Sabine Pass	1670
Energy Confidence	153,000	Tokyo LNG Tanker Co. & NYK	Kawasaki	Apr-09	Japan	Steam	Moss	4	Darwin LNG	1611
Energy Endeavour	173,400	Rossini Navigation SA	Daewoo	Jan-21	M. Islnds.	ME-GI	GT NO 96 GW	–	–	2484
Energy Frontier	147,599	Tokyo LNG Tanker Co.	Kawasaki	Sep-03	Japan	Steam	Moss	4	Sakhalin II	1520
Energy Glory	165,000	NYK Line	Japan Marine United	Mar-19	Japan	TFDE	TZ Mk. III Flex+	4	Cove Point	5071
Energy Horizon	177,000	Tokyo LNG Tanker Co. & NYK	Kawasaki	Aug-11	Japan	Steam	Moss	4	Pluto	1664
Energy Innovator	165,000	Tokyo Gas	Japan Marine United	Jun-19	Panama	TFDE	TZ Mk. III Flex+	4	Cove Point	5072
Energy Integrity	173,400	Mozart Navigation SA	Daewoo	May-21	M. Islnds.	ME-GI	GT NO 96 GW	4	–	2485
Energy Intelligence	173,400	Strauss Navigation SA	Daewoo	Jun-21	M. Islnds.	ME-GI	GT NO 96 GW	4	–	2500
Energy Liberty	165,000	Mitsui O.S.K. Lines	Japan Marine United	Oct-18	Japan	TFDE	TZ Mk. III Flex+	4	Cove Point	5070
Energy Navigator	145,000	Tokyo LNG Tanker Co.	Kawasaki	May-08	Japan	Steam	Moss	4	Sakhalin II	1600
Energy Pacific	173,400	Ravel Navigation SA	Daewoo	Aug-20	M. Islnds.	ME-GI	GT NO 96 GW	4	Portfolio	2483
Energy Progress	147,558	Jovial Shipping Navigation	Kawasaki	Nov-06	Bahamas	Steam	Moss	4	Darwin LNG	1540
Energy Universe	166,571	Tokyo LNG Tanker Co.	Japan Marine United	Aug-19	Panama	TFDE	TZ Mk. III Flex	4	Cove Point	5073
Enshu Maru	164,700	Mitsui O.S.K. Lines	Kawasaki	Aug-18	Panama	Reheat Steam Turbine	Moss	4	Wheatstone	1720
Esshu Maru	153,000	Mitsui O.S.K. Lines	Mitsubishi	Dec-14	Bahamas	–	Sayaendo	4	Portfolio	–
Etyfa Prometheas	135,269	Shell Bermuda (Overseas) Ltd.	Mitsubishi	Oct-02	Singapore	Steam	Moss	5	Peru LNG	2172
Excalibur	138,034	Exmar Excalibur Shipping Co.	Daewoo	May-02	Belgium	Steam	GT NO 96	4	Portfolio	2206
Fedor Litke	172,410	Arctic LNG 2 Ltd.	Daewoo	May-17	Cyprus	TFDE - Azipod	GT NO 96 GW	4	Yamal	2422
Flex Amber	174,000	Bund 10 Holding Ltd.	HHI	Oct-20	M. Islnds.	X-DF	TZ Mk. III Flex	4	Portfolio	8011
Flex Artemis	174,000	Flex LNG Rreliance Ltd.	Daewoo	Aug-20	M. Islnds.	ME-GI	NO-96-GW+FRS	4	Portfolio	2479
Flex Aurora	174,000	Flex LNG Aurora Ltd.	HHI	Jun-20	M. Islnds.	X-DF	TZ Mk. III Flex	4	Portfolio	8010
Flex Constellation	173,400	Frontline	Daewoo	Jun-19	M. Islnds.	ME-GI	NO-96-GW+PRS	4	Portfolio	H2470
Flex Courageous	173,400	Frontline	Daewoo	Aug-19	M. Islnds.	ME-GI	NO-96-GW+PRS	4	–	2471
Flex Endeavour	172,400	Flex LNG	Daewoo	Jan-18	U.K.	ME-GI	NO-96-GW+PRS	4	–	2447

Flex Enterprise	172,400	Flex LNG	Daewoo	Jan-18	U.K.	ME-GI	NO-96-GW+PRS	4	Portfolio	2448
Flex Freedom	173,400	Flex Freedom Ltd.	Daewoo	Jan-21	M. Islnds.	ME-GI	NO-96-GW+FRS	4	Portfolio	2492
Flex Rainbow	174,000	Flex LNG	Samsung	Jun-18	Isle of Man	ME-GI	TZ Mk. III Flex	4	–	2108
Flex Ranger	174,101	Flex LNG	Samsung	Jun-18	Isle of Man	ME-GI	TZ Mk. III Flex	4	–	2107
Flex Resolute	173,400	Flex LNG Resolute Ltd.	HHI	Sep-20	M. Islnds.	ME-GI	NO-96-GW+FRS	4	Portfolio	2480
Flex Vigilant	174,000	Flex Vigilant Ltd.	HHI	May-21	Liberia	X-DF	TZ Mk. III Flex	4	Portfolio	8013
Flex Volunteer	174,000	Flex Volunteer Ltd.	HHI	Jan-21	M. Islnds.	X-DF	TZ Mk. III Flex	4	–	8012
Fraiha	210,100	J5 Nakilat No.6 Ltd.	Daewoo	Aug-08	M. Islnds.	Diesel	GT NO 96	18	RasGas III	2252
Fuji LNG	149,172	Aletheia Owning Co.	Kawasaki	Mar-04	Malta	Steam	Moss	4	Sabine Pass	1527
Fuwairit	138,200	Camartina Shipping Co.	Samsung	Jan-04	Bahamas	Steam	TZ Mk. III	4	RasGas II	1406
Gail Bhuwan	180,000	Primavera Montana SA	Daewoo	Feb-21	M. Islnds.	X-DF	GT NO 96 GW	4	Portfolio	2499
Galicia Spirit	140,624	Teekay Gas II	Daewoo	Jul-04	Liberia	Steam	GT NO 96	4	Portfolio	2209
GasLog Chelsea	153,000	Gas-Fifteen Ltd.	Hanjin (Busan)	Jun-10	Bermuda	TFDE	TZ Mk. III	4	–	193
GasLog Galveston	174,000	Gas-Thirty Three Ltd.	Samsung	Jan-21	Bermuda	X-DF	TZ Mk. III Flex+	4	US Portfolio	2301
GasLog Geneva	174,000	GasLog	Samsung	Oct-16	Bermuda	TFDE	TZ Mk. III Flex	4	Portfolio	2102
GasLog Genoa	174,000	GasLog	Samsung	Mar-18	Bermuda	X-DF	TZ Mk. III Flex	4	Portfolio	2130
GasLog Georgetown	174,000	Gas-Thirty Two Ltd.	Samsung	Nov-20	Bermuda	–	TZ Mk. III Flex+	4	Portfolio	2300
GasLog Gibraltar	174,000	Gas-Fourteen Ltd.	Samsung	Nov-16	Bermuda	TFDE	TZ Mk. III Flex	4	Portfolio	2103
GasLog Gladstone	174,000	GasLog	Samsung	Mar-19	Bermuda	X-DF	TZ Mk. III Flex+	4	Portfolio	2131
GasLog Glasgow	174,000	GasLog	Samsung	Jul-16	Bermuda	TFDE	TZ Mk. III Flex	4	Portfolio	2073
GasLog Greece	174,000	GasLog	Samsung	Mar-16	Bermuda	TFDE	TZ Mk. III Flex	4	Portfolio	2072
GasLog Hong Kong	174,000	GasLog	HHI	Mar-18	Bermuda	X-DF	TZ Mk. III Flex	4	Portfolio	2801
GasLog Houston	174,000	GasLog	HHI	Dec-18	Bermuda	X-DF	TZ Mk. III Flex	4	GoM	2800
GasLog Salem	155,000	GasLog	Samsung	May-15	Bermuda	TFDE	TZ Mk. III	4	Portfolio	2044
GasLog Santiago	155,000	Gas-Four Ltd.	Samsung	Mar-13	Bermuda	TFDE	TZ Mk. III	4	Portfolio	1947
GasLog Saratoga	155,000	GasLog	Samsung	Dec-14	Bermuda	TFDE	TZ Mk. III	4	Spot	2043
GasLog Savannah	155,000	Gas-One Ltd.	Samsung	May-10	Liberia	TFDE	TZ Mk. III	4	Portfolio	1641
GasLog Seattle	155,000	Gas-Seven Ltd.	Samsung	Oct-13	Bermuda	TFDE	TZ Mk. III	4	Portfolio	2041
GasLog Shanghai	155,000	Gas-Three Ltd.	Samsung	Feb-13	Bermuda	TFDE	TZ Mk. III	4	Portfolio	1946
GasLog Singapore	155,000	Gas-Two Ltd.	Samsung	Aug-10	Liberia	TFDE	TZ Mk. III	4	Portfolio	1642
GasLog Skagen	155,000	Gas-Six Ltd.	Samsung	Aug-13	Bermuda	TFDE	TZ Mk. III	4	Portfolio	2017
GasLog Sydney	155,000	Gas-Five Ltd.	Samsung	Jun-13	Bermuda	–	TZ Mk. III	4	Portfolio	2016
GasLog Wales	180,000	GasLog	Samsung	May-20	Bermuda	X-DF	TZ Mk. III Flex+	4	Portfolio	2274
GasLog Warsaw	180,000	GasLog	Samsung	Jul-19	Bermuda	X-DF	TZ Mk. III Flex+	4	Portfolio	2212
GasLog Wellington	176,400	GAS-Thirty Four Ltd.	Samsung	Jun-21	Bermuda	X-DF	TZ Mk. III Flex+	4	US Portfolio	2311
GasLog Westminster	180,000	Gas-Thirty Ltd.	Samsung	Jul-20	Malta	X-DF	TZ Mk. III Flex	4	Portfolio	2262
GasLog Winchester	176,400	Gas-Thirty Five Ltd.	Samsung	Aug-21	Bermuda	X-DF	TZ Mk. III Flex+	4	US Portfolio	2312
GasLog Windsor	180,000	GasLog	Samsung	Apr-20	Bermuda	X-DF	TZ Mk. III Flex	4	Portfolio	2213
Gemmata	135,269	Shell Bermuda (Overseas) Ltd.	Mitsubishi	Feb-04	Singapore	Steam	Moss	5	Peru LNG	2183
Georgiy Brusilov	172,410	Arctic LNG 3 Ltd.	Daewoo	Nov-18	Cyprus	TFDE - Azipod	GT NO 96 GW	4	Yamal	2427
Georgiy Ushakov	172,652	Teekay Corp.	Daewoo	Sep-19	Bahamas	ME-GI	GT NO 96 GW	4	Yamal	2433
Ghasha	137,000	Ghasha Inc.	Mitsui E&S	Jun-95	Liberia	Steam	Moss	5	Das Island	1392
Gigira Laitebo	177,419	Cleopatra LNG Shipping Co.	HHI	Feb-10	Bahamas	–	TZ Mk. III	4	RasGas	1876
Global Energy	74,100	GDF Armateur 2	STX	Jan-04	France	Diesel/Gas-Electric	CS1	4	Portfolio	32M
Global Energy	173,400	Hai Kuo Shipping 2118G Ltd.	Daewoo	May-20	Greece	ME-GI	GT NO 96 GW	4	Portfolio	2478
Global Sea Spirit	169,932	Global Sea Spirit Inc	Daewoo	Oct-21	Greece	ME-GI	–	4	US Portfolio	2502
Global Star	173,400	Hai Kuo Shipping 2119G Ltd.	Daewoo	Jan-21	M. Islnds.	ME-GI	GT NO 96 GW	4	Portfolio	2487
Golar Arctic	140,648	Golar LNG 2216 Corp.	Daewoo	Oct-03	Singapore	Steam	GT NO 96	4	Jamaica LNG	2216
Golar Bear	160,000	Golar LNG	Samsung	Sep-14	M. Islnds.	Diesel/Gas-Electric	TZ Mk. III Flex	4	Spot	2027
Golar Celsius	160,000	Golar Hull M2026 Corp.	Samsung	Oct-13	M. Islnds.	Diesel/Gas-Electric	TZ Mk. III Flex	4	Spot	2026
Golar Crystal	159,800	Golar LNG	Samsung	Sep-14	M. Islnds.	–	TZ Mk. III Flex	4	Spot	2022
Golar Frost	160,000	Golar LNG	Samsung	Oct-14	M. Islnds.	Diesel/Gas-Electric	TZ Mk. III Flex	4	Portfolio	2055
Golar Glacier	162,000	Golar LNG	Hyundai Samho	Nov-14	M. Islnds.	TFDE	TZ Mk. III Flex	4	Spot	–
Golar Grand	145,700	Golar Grand Corp.	Daewoo	Jan-06	M. Islnds.	Steam	GT NO 96	4	Gorgon	2226
Golar Ice	160,000	Golar LNG	Samsung	Jan-15	Bermuda	Diesel Electric	TZ Mk. III Flex	4	Spot	2048
Golar Kelvin	162,000	Golar LNG	Hyundai Samho	Jan-15	M. Islnds.	DFDS	TZ Mk. III Flex	4	Spot	S659
Golar Maria	145,700	Golar LNG 2234 LLC	Daewoo	Jun-06	M. Islnds.	Steam	GT NO 96	4	Spot	2234
Golar Penguin	160,000	Golar LNG	Samsung	Sep-14	M. Islnds.	–	TZ Mk. III Flex	4	Spot	2023
Golar Seal	160,000	Golar Hull M2021 Corp.	Samsung	Sep-13	M. Islnds.	Diesel/Gas-Electric	TZ Mk. III Flex	4	Spot	2021
Golar Snow	160,000	Golar LNG	Samsung	Jan-15	Bermuda	Diesel/Gas-Electric	TZ Mk. III Flex	4	Spot	2047
Grace Acacia	149,700	Algawin Shipping Inc.	HHI	Feb-07	Bahamas	Steam	TZ Mk. III	4	Spot	1728
Grace Barleria	149,700	NYK LNG Shipmanagement	HHI	Apr-07	Bahamas	–	TZ Mk. III	4	Portfolio	1729
Grace Cosmos	150,000	Algahunt Shipping Inc.	HHI	Feb-08	Bahamas	Steam	TZ Mk. III	4	Portfolio	1730
Grace Dahlia	177,000	NYK Line	Kawasaki	Sep-13	Japan	Steam	Moss	4	Spot	1665
Grace Emilia	174,000	Akizuki Maritima SA	Hyundai Samho	Oct-21	Bahamas	X-DF	–	4	Portfolio	8032
Grand Aniva	145,000	NYK-SCF LNG Shipping No. 1	Mitsubishi	Jan-08	Cyprus	Steam	Moss	4	Sakhalin II	2230
Grand Elena	145,580	NYK-SCF LNG Shipping No. 1	Mitsubishi	Oct-07	Cyprus	Steam	Moss	4	Sakhalin II	2229
Grand Mereya	147,000	Ice Gas LNG Shipping Co.	Mitsui E&S	Mar-08	Cyprus	Steam	Moss	4	Sakhalin II	1681
Gui Ying	170,701	Fortune Power Shipping Ltd.	Hudong Zhonghua	Oct-21	Singapore	X-DF	GT NO 96 L03+	4	Portfolio	H1828A
Hanjin Muscat	138,366	Pluto Lease Corp.	Hanjin (Busan)	Jul-99	Panama	Steam	GT NO 96	4	Oman LNG	54

Hanjin Pyeongtaek	130,636	Hanjin Shipping Co.	Hanjin (Busan)	Sep-95	Panama	Steam	GT NO 96	4	Bontang	16
Hanjin Ras Laffan	138,214	KSH International	Hanjin (Busan)	Jul-00	Panama	Steam	GT NO 96	4	RasGas I	62
Hanjin Sur	138,333	KSG International	Hanjin (Busan)	Feb-00	Panama	Steam	GT NO 96	4	Oman LNG	61
Hellas Athina	170,520	Kronos Shipping LLC	Hyundai Samho	Sep-21	Malta	X-DF	TZ Mk. III Flex	4	Portfolio	8040
Hellas Diana	174,000	Zeus Shipping LLC	Hyundai Samho	Mar-21	Malta	X-DF	TZ Mk. III Flex	4	Portfolio	8039
Hispania Spirit	145,500	Teekay Gas Naviera SL	Daewoo	Aug-02	Spain	Steam	GT NO 96	4	Peru LNG	2205
HongKong Energy	138,000	Chevron LNG Shipping Co.	Daewoo	Feb-04	Australia	Steam	GT NO 96	4	North West Shelf	2214
Hyundai Aquapia	137,415	H&S Shipping	HHI	May-00	Panama	Steam	Moss	4	Oman LNG	1156
Hyundai Cosmopia	137,415	H&B Shipping	HHI	Feb-00	Panama	Steam	Moss	4	RasGas I	1074
Hyundai Ecopia	149,745	KLT 1 International	HHI	Nov-08	Panama	–	TZ Mk. III	4	Balhaf	1903
Hyundai Greenpia	125,000	Hyundai Merchant Marine	HHI	May-96	Panama	Steam	Moss	4	MLNG	853
Hyundai Oceanpia	135,000	H&T Shipping	HHI	Jun-00	Panama	Steam	Moss	4	Oman LNG	1157
Hyundai Peacepia	174,000	Hyundai LNG Shipping	Daewoo	Jun-17	Panama	ME-GI	GT NO 96 GW	4	Sabine Pass	2452
Hyundai Princepia	174,000	Hyundai LNG Shipping	Daewoo	May-17	Panama	ME-GI	GT NO 96 GW	4	Sabine Pass	2451
Hyundai Technopia	137,415	H&K Shipping	HHI	Jul-99	Panama	Steam	Moss	4	RasGas I	1073
Hyundai Utopia	125,182	Hyundai Merchant Marine	HHI	Jun-94	Panama	Steam	Moss	4	Donggi Senoro	760
Iberica Knutsen	138,000	Norspan LNG III AS	Daewoo	Aug-06	Norway	Ultra Steam Turbine	GT NO 96	4	Portfolio	2236
Ibra LNG	147,000	SNC Corentin	Samsung	Jul-06	Panama	Steam	TZ Mk. III	4	Oman LNG	1573
Ibri LNG	147,569	Dune LNG Carrier	Mitsubishi	Jul-06	Panama	Steam	Moss	4	Oman LNG	2215
Isabella	169,932	Kasimia Marine Co.	Daewoo	Jul-21	Greece	ME-GI	GT NO 96 GW	4	–	2495
Ish	137,000	Ish Inc.	Mitsubishi	Nov-95	Liberia	Steam	Moss	5	Das Island	2067
John A. Angelicoussis	174,000	Varta Shipping Ltd	Daewoo	Mar-22	Greece	ME-GI	–	4	–	2508
K. Acacia	138,017	Horizon Maritime Shipholding	Daewoo	Dec-99	Panama	Steam	GT NO 96	4	Oman LNG	2203
K. Freesia	138,015	Meridian Maritime Shipholding	Daewoo	Aug-00	Panama	Steam	GT NO 96	4	RasGas I	2204
K. Jasmine	145,878	Kolt JV No. 1	Daewoo	May-08	Panama	Steam	GT NO 96	4	Sakhalin II	2260
K. Mugungwha	151,812	Kolt JV No. 2	Daewoo	Nov-08	Panama	Steam	GT NO 96	4	Oman LNG	2261
KARMOL LNGT Powership Asia	127,500	BHP Consortium	Kawasaki	Jan-91	Bermuda	Steam	Moss	4	North West Shelf	1410
Kinisis	173,400	Chandris Group	Daewoo	Oct-18	Greece	ME-GI	GT NO 96 GW	4	Portfolio	2464
Kita LNG	147,895	Cardiff LNG	Daewoo	May-14	Malta	Diesel Electric	GT NO 96 L03	4	Spot	H2298
Kmarin Diamond	155,000	RBSSAF (19) Ltd.	Hyundai Samho	Jul-08	Isle of Man	Diesel/Gas-Electric	TZ Mk. III	4	Portfolio	S297
Kmarin Emerald	155,000	RBSSAF (19) Ltd.	HHI	May-07	Isle of Man	–	TZ Mk. III	4	Portfolio	1777
Kool Baltic	170,200	Sovcomflot	STX	Jan-15	Liberia	Diesel Electric	GT NO 96 GW	4	Portfolio	1912
Kool Boreas	170,200	Sovcomflot	STX	Apr-15	Liberia	Diesel Electric	GT NO 96 GW	4	Portfolio	1913
Kool Firn	174,000	Heliconia Maritime SA	HHI	Sep-20	Liberia	DFDS	TZ Mk. III Flex	4	Portfolio	8007
Kool Orca	174,000	Headliner Maritime SA	HHI	Jan-21	Liberia	X-DF	NO-96-GW+PRS	4	Portfolio	8008
Kumul	170,000	Mitsui O.S.K. Lines	Hudong Zhonghua	Dec-15	H.K., China	Diesel	GT NO 96	4	PNG LNG	1673A
La Mancha Knutsen	176,300	Norspan LNG IX	HHI	Sep-16	Spain	ME-GI	TZ Mk. III Flex	4	Portfolio	2733
La Seine	174,000	Xiang CH16 HK International	HHI	Feb-20	Malta	X-DF	TZ MK. III Flex	4	Portfolio	3020
Lalla Fatma N'Soumer	145,000	Algerian Nippon Gas Transport Corp.	Kawasaki	Oct-04	Bahamas	Steam	Moss	4	Arzew	1534
Lena River	155,000	Solana Holdings	HHI	Sep-13	M. Islnds.	–	TZ Mk. III	4	Portfolio	H2557
Lijmiliya	263,300	Nakilat Lijmiliya Inc.	Daewoo	Dec-08	M. Islnds.	Diesel	GT NO 96	5	Qatargas II	2256
LNG Abalamabie	162,000	Bonny Gas Transport	Samsung	Jul-16	Bermuda	DFDS	TZ Mk. III Flex	4	NLNG	2079
LNG Abuja II	162,000	Bonny Gas Transport	Samsung	Mar-16	Bermuda	–	TZ Mk. III Flex	4	NLNG	2078
LNG Adamawa	141,000	Bonny Gas Transport	HHI	Apr-05	Bermuda	Steam	Moss	4	NLNG	1470
LNG Adventure	174,000	Diderot Financement 28 SNC	Samsung	Mar-21	M. Islnds.	X-DF	TZ Mk. III Flex	4	Portfolio	2302
LNG Akwa Ibom	141,000	Bonny Gas Transport	HHI	Oct-04	Bermuda	Steam	Moss	4	NLNG	1469
LNG Alliance	154,472	NYK Armateur	STX	Mar-07	France	Diesel/Gas-Electric	CS1	4	Portfolio	32P
LNG Aquarius	126,300	P.T. Hanochem Shipping	General Dynamics	Jan-77	Indonesia	Steam	Moss	5	Bontang	41
LNG Barka	155,982	Lloyd's TSB General Leasing (No. 3)	Kawasaki	Dec-08	Bahamas	Steam	Moss	4	Oman LNG	1591
LNG Bayelsa	137,500	Bonny Gas Transport	HHI	Mar-03	Bermuda	–	Moss	4	NLNG	1429
LNG Benue	145,952	BW Gas LNG Carriers	Daewoo	Apr-06	Bermuda	Steam	GT NO 96	4	NLNG	2224
LNG Bonny II	174,000	Nigeria LNG	HHI	Dec-15	Bermuda	Diesel/Gas-Electric	TZ Mk. III Flex	4	NLNG	2636
LNG Borno	149,600	Okra Shipping No. 1	Samsung	Aug-07	Bermuda	Steam	TZ Mk. III	4	NLNG	1563
LNG Cross River	141,000	Bonny Gas Transport	HHI	Aug-05	Bermuda	Steam	Moss	4	NLNG	1471
LNG Dream	145,000	Osaka Gas Consortium	Kawasaki	Sep-06	Bahamas	Steam	Moss	4	North West Shelf	1545
LNG Dubhe	174,000	Mitsui O.S.K. Lines	Hudong Zhonghua	Nov-19	Panama	ME-GI	GT NO 96 L03+	4	Yamal	1810A
LNG Ebisu	147,546	LNG Ebisu Shipping Corp.	Kawasaki	Jul-08	Bahamas	–	Moss	4	Pluto	1588
LNG Endeavour	170,520	Fortune Great Shipping Ltd.	Samsung	Oct-21	France	X-DF	TZ Mk. III Flex	4	Portfolio	2355
LNG Endurance	170,520	DuPlessis Bail SNC	Samsung	Dec-21	France	X-DF	TZ Mk. III Flex	4	Portfolio	2307
LNG Enterprise	170,520	Hanovre Financement 20 SASU	Samsung	Oct-21	France	X-DF	TZ Mk. III Flex	4	Portfolio	2360
LNG Enugu	145,926	BW Gas LNG Carriers	Daewoo	Oct-05	Bermuda	Steam	GT NO 96	4	NLNG	2222
LNG Finima II	162,000	Bonny Gas Transport	Samsung	Dec-15	Bermuda	–	TZ Mk. III Flex	4	NLNG	2076
LNG Fukurokuju	164,700	Mitsui O.S.K. Lines	Kawasaki	Jul-16	Panama	Steam	Moss	4	APLNG	1712
LNG Imo	148,452	Bergesen LNG XI Ltd.	Daewoo	Jun-08	Bermuda	–	GT NO 96	4	NLNG	2232
LNG Jamal	135,333	Osaka Gas Consortium	Mitsubishi	Oct-00	Japan	Steam	Moss	5	Oman LNG	2157
LNG Juno	180,000	Mitsui O.S.K. Lines	Mitsubishi	Oct-18	Japan	STaGE	Moss	–	Freeport	2323
LNG Jupiter	153,000	Osaka Gas Consortium	Kawasaki	Jul-09	Panama	Steam	Moss	4	PNG LNG	1592
LNG Jurojin	160,000	LNG Jurojin Shipping Corp.	Mitsubishi	Nov-15	Bahamas	Steam	Moss	4	Portfolio	2299

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LNG Kano	148,565	Bergesen LNG IX Ltd.	Daewoo	Jan-07	Bermuda	Steam	GT NO 96	4	NLNG	2230
LNG Kolt	153,595	KLT 5 International	Hanjin (Busan)	Dec-08	Panama	Steam	TZ Mk. III	4	Portfolio	192
LNG Lagos II	174,000	Nigeria LNG	HHI	Jan-16	Bermuda	DFDS	TZ Mk. III Flex	4	NLNG	2637
LNG Lerici	65,000	LNG Shipping S.p.A.	Sestri Ponente	Apr-98	Italy	Steam	GT NO 96	4	Portfolio	5911
LNG Lokoja	148,471	Bergesen LNG VIII Ltd.	Daewoo	Nov-06	Bermuda	Steam	GT NO 96	4	NLNG	2229
LNG Maleo	127,544	Mitsui O.S.K. Lines	Mitsui E&S	Jan-89	Japan	Steam	Moss	4	North West Shelf	1351
LNG Mars	155,693	Osaka Gas Consortium	Mitsubishi	Oct-16	Japan	Steam	Moss	4	PNG LNG	2296
LNG Megrez	174,000	Mitsui O.S.K. Lines	Hudong Zhonghua	Nov-20	Panama	ME-GI	GT NO 96 L03+	4	Yamal	1813A
LNG Merak	174,000	Mitsui O.S.K. Lines	Hudong Zhonghua	Jan-20	Panama	ME-GI	GT NO 96 L03+	4	Yamal	1811A
LNG Ogun	149,000	Okra Shipping No. 1	Samsung	Jul-07	Bermuda	Steam	TZ Mk. III	4	NLNG	1564
LNG Ondo	148,478	Bergesen LNG X Ltd.	Daewoo	Sep-07	Bermuda	Steam	GT NO 96	4	NLNG	2231
LNG Oyo	145,842	BW Gas LNG Carriers	Daewoo	Jan-06	Bermuda	Steam	GT NO 96	4	NLNG	2223
LNG Phecda	174,000	Mitsui O.S.K. Lines	Hudong Zhonghua	Sep-20	Panama	ME-GI	GT NO 96 L03+	4	Yamal	1812A
LNG Pioneer	138,121	M & S Shipping 3 S.A.	Daewoo	Jul-05	Bahamas	Steam	GT NO 96	4	Das Island	2219
LNG Port Harcourt II	162,000	Bonny Gas Transport	Samsung	Dec-15	Bermuda	–	TZ Mk. III Flex	4	NLNG	2077
LNG Prima Carrier	137,000	Pacific Eurus Shipping	Mitsubishi	Mar-06	Bahamas	Steam	Moss	4	Das Island	2187
LNG River Niger	141,000	Bonny Gas Transport	HHI	Jul-06	Bermuda	Steam	Moss	4	NLNG	1472
LNG River Orashi	145,914	BW Gas LNG Carriers	Daewoo	Nov-04	Bermuda	Steam	GT NO 96	4	NLNG	2221
LNG Rivers	137,200	Bonny Gas Transport	HHI	Jun-02	Bermuda	–	Moss	4	NLNG	1295
LNG Rosenrot	176,523	Fair Wind Navigation SA	Daewoo	Jan-21	M. Islnds.	X-DF	GT NO 96 GW	4	Portfolio	2498
LNG Sakura	177,000	Mitsui O.S.K. Lines	Kawasaki	Feb-18	Bahamas	TFDE	Moss	–	Freeport	1731
LNG Saturn	155,300	Mitsui O.S.K. Lines	Mitsubishi	Feb-16	Bahamas	Ultra Steam Turbine	Moss	4	Gorgon	2311
LNG Schneeweisschen	180,000	Mitsui O.S.K. Lines	Daewoo	Sep-18	Bermuda	TFDE	GT NO 96 GW	–	Freeport	2462
LNG Sokoto	137,425	Bonny Gas Transport	HHI	Sep-02	Bermuda	–	Moss	4	NLNG	1296
LNG Unity	154,472	GDF Armateur 2	STX	Nov-06	France	Diesel/Gas-Electric	CS1	4	Portfolio	32N
LNG Venus	153,000	Mitsui O.S.K. Lines	Mitsubishi	Nov-14	Japan	–	Sayaendo	4	North West Shelf	2295
LNG Vesta	127,386	Tokyo LNG Tanker Co.	Mitsubishi	Jun-94	Japan	Steam	Moss	4	–	2061
LNGShips Athena	170,618	Cardiff LNG Iota Owning LLC	HHI	Mar-21	Malta	X-DF	TZ Mk. III Flex	4	–	112
LNGShips Empress	174,000	Cardiff LNG Kappa Owning LLC	Samsung	Mar-21	Malta	X-DF	TZ Mk. III Flex	4	QCLNG	2380
LNGShips Manhattan	174,000	Cardiff LNG Theta Owning LLC	HHI	May-21	Malta	X-DF-HPSCR	NO-96-GW+PRS	4	QCLNG	3039
Lobito	160,276	Mint LNG III	Samsung	Nov-11	Bahamas	–	TZ Mk. III	4	Soyo	1812
Lusail	145,000	Peninsula LNG Transport No. 1	Samsung	May-05	Bermuda	–	TZ Mk. III	4	RasGas II	1440
Macoma	145,400	Teekay LNG Partners	Daewoo	Sep-17	Bahamas	ME-GI	GT NO 96 GW	4	Portfolio	2417
Madrid Spirit	138,000	Teekay Shipping Spain S.L.	Navantia	Dec-04	Spain	Steam	GT NO 96	4	Atlantic LNG	105
Magdala	173,400	Teekay Corp.	Daewoo	Feb-18	Bahamas	ME-GI	GT NO 96 GW	4	Portfolio	2453
Magellan Spirit	165,500	Magellan Spirit ApS	Samsung	Apr-09	Denmark	Diesel/Gas-Electric	TZ Mk. III	4	Portfolio	1626
Malanje	160,276	Mint LNG II	Samsung	Oct-11	Bahamas	–	TZ Mk. III	4	Soyo	1811
Maran Gas Achilles	174,000	Maran Gas Maritime	Hyundai Samho	Jan-16	Greece	DFDS	TZ Mk. III Flex	4	Portfolio	S689
Maran Gas Agamemnon	174,000	Maran Gas Maritime	Hyundai Samho	May-16	Greece	DFDS	TZ Mk. III Flex	4	Portfolio	S690
Maran Gas Alexandria	161,870	Maran Gas Maritime	Hyundai Samho	Oct-15	Greece	–	TZ Mk. III Flex	4	QCLNG	S627
Maran Gas Amphipolis	174,000	Maran Gas Maritime	Daewoo	Aug-16	Greece	–	GT NO 96 L03	4	Portfolio	2412
Maran Gas Andros	173,400	Maran Gas Maritime	Daewoo	Nov-19	Greece	ME-GI	GT NO 96 GW	4	Freeport	2467
Maran Gas Apollonia	161,870	Maran Gas Maritime	Hyundai Samho	Jan-14	Greece	Diesel Electric	TZ Mk. III Flex	4	Punta Europa	S624
Maran Gas Asclepius	145,000	Sea Satin Corp.	Daewoo	Jul-05	Greece	Steam	GT NO 96	4	RasGas II	H2227
Maran Gas Chios	170,000	Maran Gas Maritime	Daewoo	Mar-19	Greece	ME-GI	GT NO 96 GW	4	–	2456
Maran Gas Coronis	145,700	Jopica Shipping Company	Daewoo	Jul-07	Greece	Steam	GT NO 96	4	RasGas II	2244
Maran Gas Delphi	159,800	Maran Gas Maritime	Daewoo	Feb-14	Greece	Diesel Electric	GT NO 96 L03	4	Portfolio	2296
Maran Gas Efessos	159,800	Maran Gas Maritime	Daewoo	Jun-14	Greece	–	GT NO 96 L03	4	Portfolio	H-2291
Maran Gas Hector	174,000	Maran Gas Maritime	Hyundai Samho	Nov-16	Greece	Diesel/Gas-Electric	TZ Mk. III Flex	–	Portfolio	S691
Maran Gas Hydra	173,400	Maran Gas Maritime	Daewoo	Feb-19	Greece	ME-GI	GT NO 96 GW	4	Sabine Pass	2459
Maran Gas Ithaca	174,000	Arona Maritime Inc.	Daewoo	Oct-21	Greece	X-DF	TZ Mk. III Flex	4	Portfolio	2507
Maran Gas Kalymnos	169,932	Hai Kuo Shipping 2028G Ltd	Daewoo	Sep-21	Greece	ME-GI	Membrane	4	–	2504
Maran Gas Leto	174,000	Maran Gas Maritime	Hyundai Samho	Mar-16	Greece	DFDS	TZ Mk. III	4	Portfolio	S688
Maran Gas Lindos	161,870	Maran Gas Maritime	Daewoo	Jul-15	Greece	DFDS	GT NO 96 L03	4	Punta Europa	2292
Maran Gas Mystras	155,900	Maran Gas Maritime	Daewoo	Aug-15	Greece	DFDS	GT NO 96 L03	4	QCLNG	2405
Maran Gas Olympias	174,000	Maran Gas Maritime	Daewoo	Feb-17	Greece	ME-GI	GT NO 96 L03	–	Portfolio	2415
Maran Gas Pericles	173,400	Maran Gas Maritime	Hyundai Samho	Aug-16	Greece	DFDS	TZ Mk. III Flex	4	Portfolio	S734
Maran Gas Posidonia	161,870	Maran Gas Maritime	Hyundai Samho	May-14	Greece	–	TZ Mk. III Flex	4	Punta Europa	S625
Maran Gas Psara	173,595	Highseas Shiptrade Co.	Daewoo	May-20	Greece	ME-GI	GT NO 96 GW	4	Portfolio	2469
Maran Gas Roxana	174,000	Maran Gas Maritime	Daewoo	Jan-17	Greece	ME-GI	GT NO 96 L03	4	Portfolio	2413
Maran Gas Sparta	159,800	Maran Gas Maritime	Hyundai Samho	Apr-15	Greece	–	TZ Mk. III Flex	4	QCLNG	S626
Maran Gas Spetses	173,400	Maran Gas Maritime	Daewoo	Jul-18	Greece	ME-GI	GT NO 96 GW	4	GoM	2458
Maran Gas Troy	155,000	Maran Gas Maritime	Daewoo	Sep-15	Greece	DFDS	GT NO 96 L03	4	–	2406
Maran Gas Ulysses	173,400	Maran Gas Maritime	Hyundai Samho	Jan-17	Greece	Diesel/Gas-Electric	TZ Mk. III Flex	–	Portfolio	S735
Maran Gas Vergina	174,000	Santa Lucia Enterprises Inc.	Daewoo	Dec-16	Greece	ME-GI	GT NO 96	–	Portfolio	2414
Maria Energy	174,000	Tsakos Energy Navigation	HHI	Sep-16	Greece	Diesel/Gas-Electric	TZ Mk. III Flex	4	–	2612
Marib Spirit	165,500	Membrane Shipping	Samsung	Apr-08	M. Islnds.	Diesel/Gas-Electric	TZ Mk. III	4	Balhaf	1608
Marshal Vasilevskiy	170,000	Gazprom	HHI	Jan-19	Russia	Diesel/Gas-Electric	TZ Mk. III Flex	4	Kaliningrad LNG	2854
Marvel Crane	177,000	NYK Line	Mitsubishi	Mar-19	Japan	STaGE	Moss	–	Cameron	2321
Marvel Eagle	155,000	Mitsui O.S.K. Lines	Kawasaki	Oct-18	Panama	Reheat Steam Turbine	Moss	–	Cameron	1728

Marvel Falcon	174,000	Mitsui O.S.K. Lines	Samsung	Apr-18	Singapore	TFDE	TZ Mk. III Flex	4	Cameron	2148
Marvel Hawk	177,000	Mitsui O.S.K. Lines	Samsung	Dec-18	Japan	TFDE	TZ Mk. III Flex	4	Cameron	2149
Marvel Heron	177,000	Mitsui O.S.K. Lines	Mitsubishi	Sep-19	Japan	STaGE	Moss	–	Cameron	2322
Marvel Kite	177,000	Mitsui O.S.K. Lines	Samsung	Jan-19	Japan	TFDE	TZ Mk. III	4	Cameron	2150
Marvel Pelican	156,265	Mitsui O.S.K. Lines	Kawasaki	Dec-19	Panama	Reheat Steam Turbine	Moss	4	Cameron	1729
Marvel Swan	174,000	MIF I NO 20 K/S	Samsung	Apr-21	Denmark	X-DF	TZ MK. III Flex	4	–	2310
Megara	173,400	Teekay LNG Partners	Daewoo	Jul-18	Bahamas	ME-GI	GT NO 96 GW	4	Portfolio	2455
Mekaines	266,000	Nakilat SHI 1695 Inc.	Samsung	Apr-09	M. Islnds.	–	TZ Mk. III	5	Qatargas III	1695
Merchant	138,000	Sea Breeze Leasing	Samsung	Jul-03	Isle of Man	Steam	TZ Mk. III	4	Portfolio	1381
Meridian Spirit	165,500	Meridian Spirit Aps	Samsung	Jan-10	Denmark	Diesel/Gas-Electric	TZ Mk. III	4	Portfolio	1633
Mesaimeer	216,312	Nakilat HHI 1908 Inc.	HHI	Mar-09	M. Islnds.	Diesel	TZ Mk. III	4	Qatargas III	1908
Methane Alison Victoria	145,000	Lloyds TSB Leasing No.8 Ltd.	Samsung	Apr-07	Bahamas	Steam	TZ Mk. III	4	Punta Europa	1587
Methane Becki Anne	170,000	Methane Services (Shell)	Samsung	Sep-10	Bermuda	–	TZ Mk. III	4	Singapore	1858
Methane Heather Sally	145,000	Lloyds TSB Leasing No.8 Ltd.	Samsung	Jan-07	Bahamas	Steam	TZ Mk. III	4	Punta Europa	1586
Methane Jane Elizabeth	145,000	British Gas Asia Pacific	Samsung	Jun-06	Bermuda	Steam	TZ Mk. III	4	Idku	1554
Methane Julia Louise	170,000	Methane Services (Shell)	Samsung	Apr-10	Bermuda	–	TZ Mk. III	9	Singapore	1745
Methane Kari Elin	138,267	BG Group	Samsung	May-04	Bermuda	Steam	TZ Mk. III	4	Singapore	1428
Methane Lydon Volney	145,000	BG Group	Samsung	Aug-06	Bermuda	Steam	TZ Mk. III	4	Idku	1555
Methane Mickie Harper	170,000	Methane Services (Shell)	Samsung	Dec-10	Bermuda	Diesel/Gas-Electric	TZ Mk. III	4	Singapore	1859
Methane Nile Eagle	145,000	Egypt LNG Shipping	Samsung	Dec-07	Bermuda	Steam	TZ Mk. III	4	Idku	1588
Methane Patricia Camila	170,000	Methane Services (Shell)	Samsung	Oct-10	Bermuda	–	TZ Mk. III	4	Singapore	1746
Methane Princess	138,000	Golar LNG	Daewoo	Aug-03	U.K.	Steam	GT NO 96	4	Portfolio	2215
Methane Rita Andrea	145,000	British Gas Asia Pacific	Samsung	Apr-06	Bermuda	Steam	TZ Mk. III	4	Idku	1553
Methane Shirley Elisabeth	145,000	Lloyds TSB Leasing No.8 Ltd.	Samsung	Feb-07	Bermuda	Steam	TZ Mk. III	4	Punta Europa	1585
Methane Spirit	165,500	Malt Singapore Pvt. Ltd.	Samsung	Feb-08	M. Islnds.	Diesel/Gas-Electric	TZ Mk. III	4	Atlantic LNG	1607
Milaha Qatar	145,500	Qatar Shipping Co.	Samsung	Apr-06	Malta	Steam	TZ Mk. III	4	RasGas II	1562
Milaha Ras Laffan	138,270	Milaha Ras Laffan GmbH & Co. KG	Samsung	Apr-04	Malta	Steam	TZ Mk. III	4	RasGas II	1425
Min Lu	147,100	Minlu LNG Shipping Co.	Hudong Zhonghua	Aug-09	H.K., China	–	GT NO 96	4	Tangguh	1378
Min Rong	145,000	Min Rong LNG Shipping Co.	Hudong Zhonghua	Feb-09	H.K., China	–	GT NO 96	4	Tangguh	1320
Minerva Chios	170,520	Peninsula Shipping SA	Samsung	Aug-21	Greece	X-DF	TZ Mk. III Flex+	4	–	2305
Minerva Kalymnos	174,000	Koje Shipping SA	Samsung	Feb-21	Malta	X-DF	GT NO 96 GW	4	–	2304
Minerva Limnos	173,400	Roland Shipping SA	Daewoo	Jun-21	Greece	ME-GI	GT NO 96 GW	4	Portfolio	2482
Minerva Psara	173,400	Wimbledon Shipping SA	Daewoo	Jan-21	Malta	–	GT NO 96 GW	4	–	2481
MOL Hestia	173,400	LNG Harmonia Shipping Corp	Daewoo	Jul-21	M. Islnds.	X-DF	GT NO 96 GW	4	–	2505
Mozah	266,000	Nakilat Haloul Inc.	Samsung	Aug-09	M. Islnds.	Diesel	TZ Mk. III	5	Qatargas II	1675
Mraweh	137,000	Mraweh Ltd.	STX	Apr-96	Liberia	Steam	Moss	4	Das Island	1331
Mu Lan	174,400	Fortune Great Shipping Ltd.	Hudong Zhonghua	Aug-21	Liberia	X-DF	GT NO 96 L03+	4	Portfolio	1827A
Mubaraz	137,000	Mubaraz Ltd.	STX	Dec-95	Liberia	Steam	Moss	4	Das Island	1330
Murex	173,400	Teekay LNG Partners	Daewoo	Jul-17	Bahamas	ME-GI	GT NO 96 GW	4	Portfolio	2416
Murwab	210,100	J5 Nakilat No. 4 Ltd.	Daewoo	Jun-08	M. Islnds.	Diesel	GT NO 96	18	RasGas III	251
Myrina	173,400	Teekay Corp.	Daewoo	May-18	Bahamas	ME-GI	GT NO 96 GW	4	Portfolio	2454
Neo Energy	150,000	Sea Optima	HHI	Jan-07	Liberia	Steam	TZ Mk. III	4	Portfolio	1754
Neptune	145,130	SRV Joint Gas Ltd.	Samsung	Nov-09	Norway	–	TZ Mk. III	4	Portfolio	1688
Nikolay Urvantsev	172,658	China Shipping Development Co.	Daewoo	Jul-19	H.K., China	ME-GI	GT NO 96 GW	4	Yamal	2432
Nikolay Yevgenov	172,410	Teekay Corp.	Daewoo	Apr-19	Bahamas	ME-GI	GT NO 96 GW	4	Yamal	2430
Nikolay Zubov	172,410	Arctic LNG 5 Ltd.	Daewoo	Nov-18	Cyprus	TFDE - Azipod	GT NO 96 GW	4	Yamal	2429
Nizwa LNG	147,684	Oryx LNG Carrier	Kawasaki	Dec-05	Panama	Steam	Moss	4	Oman LNG	1562
Nohshu Maru	180,000	Mitsui O.S.K. Lines	Mitsubishi	Feb-19	Bahamas	Reheat Steam Turbine	Moss	4	–	2326
Northwest Sanderling	127,525	Shell Tankers Australia	Mitsubishi	Jan-89	Australia	Steam	Moss	4	North West Shelf	1996
Northwest Sandpiper	125,042	Shell Tankers Australia	Mitsui E&S	Jan-93	Australia	Steam	Moss	4	North West Shelf	1370
Northwest Snipe	127,500	International Gas Transportation Co., Ltd.	Mitsui E&S	Jan-90	Australia	Steam	Moss	4	North West Shelf	1352
Northwest Stormpetrel	127,500	Shell Tankers Australia	Mitsubishi	Dec-94	Australia	Steam	Moss	4	North West Shelf	2074
Oak Spirit	173,400	Teekay LNG Partners	Daewoo	Mar-16	Bahamas	ME-GI	GT NO 96 GW	–	Sabine Pass	2408
Ob River	149,700	Lance Shipping	HHI	May-07	M. Islnds.	Steam	TZ Mk. III	4	Sakhalin II	1719
Oceanic Breeze	155,300	"K" Line - Kawasaki Kisen Kaisha	Mitsubishi	Apr-18	Japan	Reheat Steam Turbine	Moss	4	Ichthys	2310
Onaiza	210,150	Nakilat DSME 2266 Inc.	Daewoo	Apr-09	M. Islnds.	Diesel	GT NO 96	12	Qatargas III	2266
Orion Sea	170,852	Meridian 23 Ltd.	Samsung	Jan-22	Liberia	X-DF	TZ Mk. III	4	Portfolio	2336
Orion Star	174,000	Jupiter 3 Ltd	Samsung	Apr-22	Liberia	–	–	4	–	2319
Ougarta	170,000	Hyproc Shipping Co.	HHI	Mar-17	Algeria	DFDS	TZ Mk. III Flex	4	Arzew	2814
Pacific Arcadia	145,400	Bahamas LNG Shipping	Mitsubishi	Oct-14	Bahamas	–	Moss	4	PNG LNG	MHISB 2289
Pacific Breeze	180,000	"K" Line - Kawasaki Kisen Kaisha	Kawasaki	Mar-18	Japan	TFDE	Moss	4	Ichthys	1718
Pacific Enlighten	145,400	Pacific Hope Shipping	Mitsubishi	Mar-09	Panama	Steam	Moss	4	North West Shelf	2236
Pacific Mimosa	155,300	NYK Line	Mitsubishi	Mar-18	Japan	Reheat Steam Turbine	Moss	–	Wheatstone	2316
Pacific Notus	137,006	Pacific LNG Shipping	Mitsubishi	Sep-03	Bahamas	Steam	Moss	5	Darwin LNG	2176
Palu LNG	159,800	Cardiff LNG	Daewoo	Nov-14	Malta	TFDE	GT NO 96 L03	4	Spot	2400
Pan Africa	174,000	Teekay LNG Partners	Hudong Zhonghua	Jan-19	H.K., China	TFDE	GT NO 96	4	QCLNG	1666A
Pan Americas	174,000	Teekay LNG Partners	Hudong Zhonghua	Jan-18	H.K., China	TFDE	GT NO 96	4	QCLNG	H1664A
Pan Asia	174,000	Teekay LNG Partners	Hudong Zhonghua	Sep-17	H.K., China	TFDE	GT NO 96	4	QCLNG	1663A
Pan Europe	174,000	Teekay LNG Partners	Hudong Zhonghua	Jul-18	H.K., China	TFDE	GT NO 96	4	QCLNG	H1665A

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Papua	170,000	Mitsui O.S.K. Lines	Hudong Zhonghua	Nov-14	H.K., China	–	GT NO 96	4	PNG LNG	H1670A
Patris	174,000	Chandris Group	Daewoo	Jan-18	Liberia	ME-GI	GT NO 96 GW	4	Freeport	2460
Pearl LNG	174,000	Cardiff LNG Delta Owning LLC	Samsung	Aug-20	Malta	X-DF	NO-96-GW+PRS	4	Portfolio	2275
Point Fortin	154,200	Los Halillos Shipping Co.	Koyo Dockyard	Jan-10	Panama	Steam	TZ Mk. III	4	Portfolio	2263
Polar Spirit	89,800	Polar Spirit LLC	Ishikawajima	Jun-93	Liberia	Steam	IHI SPB	4	Atlantic LNG	3015
Portovenere	65,000	LNG Shipping S.p.A.	Sestri Ponente	Apr-97	Italy	Steam	GT NO 96	4	Portfolio	5910
Portovyy	138,107	Monteriggioni Inc.	Daewoo	Aug-03	Belgium	Steam	GT NO 96	4	Portfolio	2213
Prachi	162,000	India LNG Transport Company No. 4 Ltd.	HHI	Nov-16	Singapore	Diesel/Gas-Electric	TZ Mk. III Flex	–	Gorgon	2633
Prism Agility	180,000	SK Shipping	HHI	May-19	Panama	X-DF	TZ Mk. III Flex	4	Portfolio	2937
Prism Brilliance	180,000	SK Shipping	HHI	May-19	Panama	X-DF	TZ Mk. III Flex	4	Portfolio	2938
Prism Courage	176,462	Millenaire Financement 12 SASU	HHI	Oct-21	Panama	X-DF	TZ Mk. III Flex	4	Portfolio	2939
Pskov	170,200	Sovcomflot	STX	Sep-14	Liberia	–	GT NO 96	4	Portfolio	1911
Puteri Delima	130,400	Puteri Delima S.Bhd.	STX	Jan-95	Malaysia	Steam	GT NO 96	4	MLNG II	30F
Puteri Delima Satu	137,100	MISC	Mitsui E&S	Oct-02	Malaysia	Steam	GT NO 96	4	MLNG III	1506
Puteri Firus Satu	137,100	Puteri Firus S.Bhd.	Mitsubishi	Aug-04	Malaysia	Steam	GT NO 96	4	MLNG III	2177
Puteri Intan	137,100	Puteri Intan S.Bhd.	STX	Aug-94	Malaysia	Steam	GT NO 96	4	MLNG II	30E
Puteri Intan Satu	137,100	MISC	Mitsubishi	Aug-02	Malaysia	Steam	GT NO 96	4	MLNG III	2165
Puteri Mutiara Satu	137,100	MISC	Mitsui E&S	Apr-05	Malaysia	Steam	GT NO 96	4	MLNG III	1562
Puteri Nilam	130,400	Puteri Nilam S.Bhd.	STX	Jul-95	Malaysia	Steam	GT NO 96	4	MLNG II	30G
Puteri Nilam Satu	137,100	Puteri Nilam S.Bhd.	Mitsubishi	Jul-03	Malaysia	Steam	GT NO 96	4	MLNG III	2169
Puteri Zamrud	130,400	Puteri Zamrud S.Bhd.	STX	Jun-96	Malaysia	Steam	GT NO 96	4	MLNG II	30H
Puteri Zamrud Satu	137,100	MISC	Mitsui E&S	Feb-04	Malaysia	–	GT NO 96	4	MLNG III	1507
Qogir	174,000	LNGShips	Samsung	Jun-20	Malta	X-DF	TZ MK. III Flex	–	Portfolio	2271
Raahi	138,076	India LNG Transport Company No.2 Ltd.	Daewoo	Oct-04	Malta	Steam	GT NO 96	4	RasGas	2211
Rasheeda	266,000	Nakilat SHI 1754 Inc.	Samsung	Aug-10	M. Islnds.	Diesel	TZ Mk. III	10	Qatargas IV	1754
Rias Baixas Knutsen	180,000	Knutsen OAS Shipping	HHI	Sep-19	Norway	ME-GI	TZ Mk. III Flex	4	Corpus Christi	2964
Ribera del Duero Knutsen	173,400	Norspan LNG VIII AS	Daewoo	Dec-10	Norway	–	GT NO 96	4	Portfolio	2275
Rioja Knutsen	170,000	Norspan LNG X	HHI	Dec-16	Norway	ME-GI	TZ Mk. III Flex	4	Portfolio	2734
Rudolf Samoylovich	172,410	Teekay Corp.	Daewoo	Aug-18	Bahamas	ME-GI	GT NO 96 GW	4	Yamal	2425
Salalah LNG	147,000	Tiwi LNG Carrier S.A.	Samsung	Dec-05	Panama	Steam	TZ Mk. III	4	Oman LNG	1536
SCF Barents	174,000	Heliconia Maritime SA	HHI	Sep-20	Liberia	DFDS	TZ Mk. III Flex	4	Portfolio	8007
SCF La Perouse	174,000	Albus Shipping Ltd.	HHI	Feb-20	Liberia	X-DF	NO-96-GW+PRS	4	Portfolio	8006
SCF Melampus	170,200	Sovcomflot	STX	Jan-15	Liberia	Diesel Electric	GT NO 96 GW	4	Portfolio	1912
SCF Mitre	170,200	Sovcomflot	STX	Apr-15	Liberia	Diesel Electric	GT NO 96 GW	4	Portfolio	1913
SCF Timmerman	174,000	Headliner Maritime SA	HHI	Jan-21	Liberia	X-DF	NO-96-GW+PRS	4	Portfolio	8008
Sean Spirit	174,162	Teekay LNG Partners	Hyundai Samho	Dec-18	Bermuda	ME-GI	TZ Mk. III Flex	–	Freeport	S856
Seapeak Arwa	165,500	Membrane Shipping	Samsung	Aug-08	M. Islnds.	Diesel/Gas-Electric	TZ Mk. III	4	Balhaf	1625
Seapeak Galicia	140,624	Teekay Gas II	Daewoo	Jul-07	Liberia	Steam	GT NO 96	4	Portfolio	2209
Seapeak Hispania	145,500	Teekay Gas Naviera SL	Daewoo	Aug-02	Spain	Steam	GT NO 96	4	Peru LNG	2205
Seapeak Polar	89,800	Polar Spirit LLC	Ishikawajima	Jun-93	Liberia	Steam	IHI SPB	4	Atlantic LNG	3015
Seapeak Vancouver	173,400	Teekay LNG Partners	Daewoo	Nov-16	Bahamas	ME-GI	GT NO 96 GW	–	Portfolio	2411
Seishu Maru	138,000	Mitsui O.S.K. Lines	Mitsubishi	Sep-14	Bahamas	–	Moss	4	PNG LNG	2297
Senshu Maru	127,167	Mitsui O.S.K. Lines	Mitsui E&S	Feb-84	Japan	Steam	Moss	5	Bontang	1230
Seri Alam	145,572	MISC	Samsung	Jul-05	Malaysia	–	TZ Mk. III	4	Bintulu	1502
Seri Amanah	145,709	MISC	Samsung	Mar-06	Malaysia	Steam	TZ Mk. III	4	Bintulu	1503
Seri Anggun	145,731	MISC	Samsung	Oct-06	Malaysia	Steam	TZ Mk. III	4	North West Shelf	1589
Seri Angkasa	145,130	MISC	Samsung	Dec-06	Malaysia	Steam	TZ Mk. III	4	Bintulu	1590
Seri Ayu	145,894	MISC	Samsung	Oct-07	Malaysia	Steam	TZ Mk. III	4	Bintulu	1591
Seri Bakti	152,944	MISC	Mitsubishi	Apr-07	Malaysia	Steam	GT NO 96	4	Gladstone	2220
Seri Balhaf	152,000	MISC	Mitsubishi	Jan-09	Malaysia	Steam	GT NO 96	4	Bontang	2223
Seri Balqis	152,000	MISC	Mitsubishi	Mar-09	Malaysia	Steam	GT NO 96	4	NLNG	2224
Seri Begawan	152,900	MISC	Mitsubishi	Nov-07	Malaysia	Steam	GT NO 96	4	Bintulu	2221
Seri Bijaksana	152,300	MISC	Mitsubishi	Apr-08	Malaysia	Steam	GT NO 96	4	Bintulu	2222
Seri Camar	150,000	MISC	HHI	Feb-18	Malaysia	Ultra Steam Turbine	Moss	4	Pacific Northwest	2732
Seri Camellia	159,800	MISC	HHI	Sep-16	Malaysia	Ultra Steam Turbine	TZ MK. III Flex	4	Pacific Northwest	2729
Seri Cemara	150,200	MISC	HHI	Apr-18	Malaysia	Ultra Steam Turbine	Moss	4	Portfolio	2735
Seri Cempaka	162,000	MISC	HHI	Aug-17	Malaysia	Ultra Steam Turbine	TZ MK. III Flex	4	Pacific Northwest	2731
Seri Cenderawasih	162,000	MISC	HHI	Feb-17	Malaysia	Ultra Steam Turbine	Moss	4	Pacific Northwest	2730
Sestao Knutsen	136,947	Norspan LNG IV AS	Navantia Cadiz	Oct-07	Spain	Steam	GT NO 96	4	Portfolio	331
Sevilla Knutsen	173,400	Norspan LNG VI AS	Daewoo	May-10	Spain	Diesel/Gas-Electric	GT NO 96	4	Portfolio	2269
Shagra	268,000	Nakilat SHI 1751 Inc.	Samsung	Nov-09	M. Islnds.	Diesel	TZ Mk. III	10	Qatargas IV	1751
Shahamah	135,496	Shahamah Inc.	Kawasaki	Oct-94	Liberia	Steam	Moss	5	Das Island	1438
Shandong Juniper	135,269	Shell Bermuda (Overseas) Ltd.	Mitsubishi	Feb-04	Singapore	Steam	Moss	5	Peru LNG	2183
Shen Hai	147,200	Shanghai LNG Shipping Co.	Hudong Zhonghua	Dec-12	H.K., China	Steam	GT NO 96	4	Bintulu	H1621A
Shinshu Maru	180,000	Mitsui O.S.K. Lines	Kawasaki	Feb-19	Japan	DERST (aka STaGE)	Moss	4	Freeport	1734
Simaisma	145,889	Greenwell Corporation	Daewoo	Jul-06	Bermuda	Steam	GT NO 96	8	RasGas II	2235
Singapore Energy	138,000	Sea Breeze Leasing	Samsung	Feb-03	Isle of Man	Steam	TZ Mk. III	4	Portfolio	1416
SK Audace	174,000	Milestone LNG Transport	Samsung	Aug-17	Panama	X-DF	TZ Mk. III Flex	4	Portfolio	2080
SK Resolute	180,000	Milestone LNG Transport	Samsung	Nov-17	Panama	X-DF	TZ Mk. III Flex	4	Ichthys	2081

SK Serenity	174,000	SK Shipping	Samsung	Feb-18	South Korea	TFDE	KC-1	4	Sabine Pass	2153
SK Spica	174,117	SK Shipping	Samsung	Mar-18	South Korea	TFDE	KC-1	–	Sabine Pass	2154
SK Splendor	138,370	Optima Leasing	Samsung	May-00	Panama	Steam	TZ Mk. III	4	Oman LNG	1258
SK Stellar	138,375	Stellar Shipholding	Samsung	Dec-00	Panama	Steam	TZ Mk. III	4	RasGas I	1259
SK Summit	138,003	Omnia Enterprises	Daewoo	Aug-99	Panama	Steam	GT NO 96	4	RasGas I	2202
SK Sunrise	138,306	Methane Navigation S.A.	Samsung	Aug-03	Panama	Steam	TZ Mk. III	4	RasGas II	1405
SK Supreme	138,225	Celeste Maritime	Samsung	Feb-00	Panama	Steam	TZ Mk. III	4	RasGas I	1207
SM Eagle	174,000	Korea Line Corp.	Daewoo	May-17	Panama	ME-GI	GT NO 96 GW	4	Sabine Pass	2449
SM Seahawk	174,000	Korea Line Corp.	Daewoo	Jun-17	Panama	ME-GI	GT NO 96 GW	4	Sabine Pass	2450
Sohar LNG	137,248	Energy Spring LNG Carriers	Mitsubishi	Oct-01	Malta	Steam	Moss	5	Oman LNG	2162
Sohshu Maru	177,000	Mitsui O.S.K. Lines	Kawasaki	Jul-19	Japan	DERST (aka STaGE)	Moss	4	Freeport	1735
Solaris	155,000	GasLog	Samsung	Jul-14	Bermuda	Diesel/Gas-Electric	TZ Mk. III	4	Portfolio	2042
Sonangol Benguela	160,500	Sonangol Benguela Ltd.	Daewoo	Dec-11	Bahamas	–	GT NO 96	4	Soyo	2282
Sonangol Etosha	160,500	Sonangol Etosha Ltd.	Daewoo	Sep-11	Bahamas	–	GT NO 96	4	Soyo	2281
Sonangol Sambizanga	160,500	Sonangol Sambizanga Ltd.	Daewoo	Aug-11	Bahamas	–	GT NO 96	4	Soyo	2280
Southern Cross	172,000	Mitsui O.S.K. Lines	Hudong Zhonghua	Jul-15	H.K., China	ME-GI	GT NO 96	4	PNG LNG	H1671A
Soyo	160,276	Mint LNG I	Samsung	Aug-11	Bahamas	–	TZ Mk. III	4	Soyo	1810
Spirit of Hela	177,000	Nefertiti LNG Shipping Co.	Hyundai Samho	Nov-10	Bahamas	Diesel Electric	TZ Mk. III	4	PNG LNG	S324
Stena Blue Sky	145,700	Blue Sky LNG	Daewoo	Aug-06	Panama	Steam	GT NO 96	4	Spot	2233
Stena Clear Sky	171,800	Clear Sky LNG Shipping	Daewoo	May-11	U.K.	Diesel/Gas-Electric	GT NO 96	4	Portfolio	2278
Stena Crystal Sky	171,800	Stena Drilling Cyprus	Daewoo	May-11	U.K.	Diesel/Gas-Electric	GT NO 96	4	Portfolio	2268
Symphonic Breeze	145,394	Reborn Maritime	Kawasaki	Dec-07	Bahamas	Steam	Moss	4	Portfolio	H1587
Taitar No 1	145,000	NiMic No 1 S.A.	Mitsubishi	Oct-09	Panama	–	Moss	4	RasGas	2241
Taitar No 2	145,000	NiMic No 2 S.A.	Kawasaki	Dec-09	Panama	–	Moss	4	RasGas	1625
Taitar No 3	145,000	NiMic No 3 S.A.	Mitsubishi	Dec-09	Panama	–	Moss	4	RasGas	2242
Taitar No 4	147,000	NiMic No 4 S.A.	Kawasaki	Aug-10	Panama	–	Moss	4	RasGas	1626
Tangguh Batur	145,700	LNG North-South Shipping Co.	Daewoo	Dec-08	Singapore	Steam	GT NO 96	4	Tangguh	2242
Tangguh Foja	155,000	Ocean 1919 Shipping No. 1	Samsung	Nov-08	Panama	–	TZ Mk. III	4	Tangguh	1619
Tangguh Hiri	155,000	Tangguh Hiri Finance Ltd.	HHI	Dec-08	Isle of Man	–	TZ Mk. III	4	Tangguh	1780
Tangguh Jaya	155,000	Ocean 1919 Shipping No. 2	Samsung	Dec-08	Panama	–	TZ Mk. III	4	Tangguh	1620
Tangguh Palung	155,000	Ocean 1919 Shipping No. 3	Samsung	Mar-09	Panama	–	TZ Mk. III	4	Tangguh	1634
Tangguh Sago	155,000	Teekay Shipping (Canada) Limited	Hyundai Samho	Dec-08	Bahamas	Diesel/Gas-Electric	TZ Mk. III	4	Tangguh	S298
Tangguh Towuti	145,700	LNG East-West Shipping Co.	Daewoo	Oct-08	Singapore	Steam	GT NO 96	4	Tangguh	2241
Tembek	216,200	Overseas LNG S1 Corp.	Samsung	Nov-07	M. Islnds.	Diesel	TZ Mk. III	4	Qatargas II	1605
Tenergy	170,520	Briety Shipping Inc	HHI	Jan-22	Greece	X-DF	TZ Mk. III	4	Portfolio	3157
Tessala	170,000	Hyproc Shipping Co.	HHI	Feb-17	Algeria	Diesel/Gas-Electric	TZ Mk. III Flex	–	Arzew	2813
Torben Spirit	173,400	Teekay LNG Partners	Daewoo	Nov-16	Bahamas	ME-GI	GT NO 96 GW	–	Portfolio	2411
Trader	138,000	K Line LNG Shipping (UK) Ltd.	Samsung	Nov-02	Isle of Man	Steam	TZ Mk. III	4	Portfolio	1380
Traiano Knutsen	180,000	Hai Kuo Shipping 1901 G Ltd.	HHI	Jul-20	Belgium	ME-GI	TZ Mk. III Flex	4	Portfolio	3086
Trinity Arrow	154,982	Luster Maritime S.A. & Cypress Maritime Panama & Los Halillos Shipping Co.	Koyo Dockyard	Feb-08	Panama	Steam	TZ Mk. III	4	Portfolio	2258
Trinity Glory	154,000	Cypress Maritime Consortium	Koyo Dockyard	Nov-08	Panama	Steam	TZ Mk. III	4	Bontang	2260
Tristar Ruby	155,000	RBSSAF (19) Ltd.	HHI	Apr-08	Isle of Man	Diesel/Gas-Electric	TZ Mk. III	4	Portfolio	1778
Umm Al Amad	210,200	J5 Nakilat No. 7 Ltd.	Daewoo	Sep-08	M. Islnds.	Diesel	GT NO 96	18	RasGas III	2253
Umm Al Ashtan	137,000	Umm Al Ashtan Ltd.	STX	May-97	Liberia	Steam	Moss	4	Das Island	1333
Umm Bab	145,000	Sea Trade International Inc.	Daewoo	Nov-05	Greece	Steam	GT NO 96	4	RasGas II	2228
Umm Slal	266,000	Nakilat Umm Slal Inc.	Samsung	Nov-08	M. Islnds.	–	TZ Mk. III	5	Qatargas II	1676
Valencia Knutsen	173,400	Norspan LNG VII AS	Daewoo	Sep-10	Spain	–	GT NO 96	4	Portfolio	2274
Velikiy Novgorod	170,200	Sovcomflot	STX	Dec-13	Liberia	–	GT NO 96	4	Portfolio	1910
Vivit Americas LNG	174,000	Cardiff LNG Zeta Owning LLC	HHI	Oct-20	Malta	X-DF	TZ Mk. III Flex	4	Portfolio	3037
Vivit City LNG	174,103	Kaiser SA	Hyundai Samho	Dec-21	Liberia	X-DF	TZ Mk. III Flex	4	Portfolio	8025
Vladimir Rusanov	174,000	Mitsui O.S.K. Lines	Daewoo	Jan-18	Bahamas	ME-GI	GT NO 96 GW	4	Yamal	2424
Vladimir Vize	172,000	China Shipping Development Co.	Daewoo	Sep-18	H.K., China	ME-GI	GT NO 96 GW	4	Yamal	2426
Vladimir Voronin	172,652	Teekay Corp.	Daewoo	Jul-19	Bahamas	ME-GI	GT NO 96 GW	4	Yamal	2431
WilForce	155,900	Wilforce LLC	Daewoo	Sep-13	Norway	–	GT NO 96	4	–	H2289
WilPride	155,900	Wilpride LLC	Daewoo	Nov-13	Norway	–	GT NO 96	4	–	H2290
Woodside Chaney	174,000	Maran Gas Maritime	Daewoo	Jul-19	Greece	ME-GI	GT NO 96 GW	4	Portfolio	2457
Woodside Charles Allen	173,400	Hai Kuo Shipping 2027G Ltd.	Daewoo	Oct-20	Greece	ME-GI	GT NO 96 GW	4	Portfolio	2486
Woodside Donaldson	165,500	Malt Singapore Pvt. Ltd.	Samsung	Oct-09	Singapore	Diesel/Gas-Electric	TZ Mk. III	4	Pluto	1632
Woodside Goode	159,800	Armour Company Ltd.	Daewoo	Nov-13	Greece	Diesel Electric	GT NO 96 GW	4	RasGas	H2295
Woodside Rees Withers	173,400	Maran Gas Maritime	Daewoo	Oct-19	Greece	ME-GI	GT NO 96 GW	4	–	2466
Woodside Rogers	159,800	Margie Seaway Corp.	Daewoo	Jul-13	Greece	Diesel/Gas-Electric	GT NO 96 GW	4	Pluto	H2288
Yakov Gakkel	172,658	DSME Hull No.2434 LLC	Daewoo	Nov-19	Bahamas	ME-GI	GT NO 96 GW	4	Yamal	2434
Yamal Spirit	174,000	Teekay LNG Partners	Hyundai Samho	Jan-19	Bermuda	ME-GI	TZ Mk. III Flex	–	Freeport	S857
Yari LNG	159,800	Cardiff LNG	Daewoo	Nov-14	Malta	TFDE	GT NO 96 L03	4	Spot	2401
Yenisei River	155,000	Navajo Marine	HHI	Jul-13	M. Islnds.	–	TZ Mk. III	4	Yamal	2556
Yiannis	169,932	Onerato Marine SA	Daewoo	Sep-21	Greece	ME-GI	GT NO 96 GW	4	Portfolio	2501
YK Sovereign	127,125	SK Shipping	HHI	Dec-94	Panama	Steam	Moss	4	MLNG	761
Zarga	268,000	Nakilat SHI 1752 Inc.	Samsung	Jan-10	M. Islnds.	–	TZ Mk. III	5	Qatargas IV	1752
Zekreet	137,482	Mitsui O.S.K. Lines	Mitsui E&S	Dec-98	Japan	Steam	Moss	5	Qatargas I	1432

Fleet – LNG Bunkering

Name	Built	Capacity	Registered Owner	Builder	Flag	Engine Type	Cargo System	No. of tanks	Project
Seagas	Sep-74	170	Linde Gas AB	Havyard Leirvik	Sweden	Diesel	Cylinder	1	Stockholm Viking Line
Coral Methane	Apr-09	7,551	Coral Methane Shipping BV	AVIC Dingheng	Netherlands	Gas-Diesel	Cylinder	4	Portfolio
Oizmendi	Jul-09	600	Itsas Gas Bunker Supply SL	Astilleros Zamakona	Spain	Diesel	Cylinder	2	Huelva
Green Zeebrugge	Feb-17	5,000	LNG Link Investment AS	Hanjin Heavy Industries	Belgium	Diesel/Gas-Electric	Cylinder	2	Zeebrugge
Cardissa	Jun-17	6,500	Shell Western LNG BV	STX	Netherlands	Diesel/Gas-Electric	Cylinder	1	Portfolio
Coralius	Aug-17	5,800	Sirius Veder Gas AB	Bodewes Shipyards	Sweden	DFDE	Cylinder	4	Portfolio
Kairos	Oct-18	7,500	Uranos Vermögensverwaltung	Hyundai Mipo	Cyprus	Gas-Diesel	Type C	4	Portfolio
Bunker Breeze	Oct-18	6,050	Molucas Naviera AIE	Astilleros Zamakona	Spain	Gas-Diesel	Cylinder	4	Algeciras
LNG London	Apr-19	3,000	LNG Shipping S.A.	Severnav S.A.	Belgium	LNGPac	Cylinder	6	ARA
SM Jeju LNG 1	Sep-19	7,500	Jeju LNG 1 S.A.	Samsung	Panama	Diesel/Gas-Electric	KC-1	1	Portfolio
SM Jeju LNG 2	Jan-20	7,500	Jeju LNG 2 S.A.	Samsung	Panama	Diesel/Gas-Electric	KC-1	1	Portfolio
Gas Agility	Apr-20	18,600	Emerald Green Maritime Ltd.	Hudong Zhonghua	Malta	DFDE	TZ Mk III Flex	2	Rotterdam
Kaguya	Sep-20	3,469	Central LNG Shipping Japan	Kawasaki	Japan	Gas-Diesel	Cylinder	1	JERA TPS
Avenir Advantage	Oct-20	7,500	Avenir L Pte Ltd.	Keppel Nantong	Malta	Gas-Diesel	Type C	2	Portfolio
Avenir Accolade	Nov-20	7,500	Stolt-Nielsen Gas Ltd.	Keppel Nantong	Malta	Gas-Diesel	Type C	2	Portfolio
FueLNG Bellina	Nov-20	7,500	FueLNG Pte Ltd.	Kappel Nantong	Singapore	Diesel/Gas-Electric	Cylinder	2	Portfolio
Dalian No. 1	Dec-20	8,330	Xinao Marine Shipping Co. Ltd.	Dalian Yard	China	Gas-Diesel	Cylinder	2	Portfolio
Marine Vicky	Jan-20	9,900	Sinanju Tankers Pte. Ltd.	Keppel Nantong	Singapore	Gas-Diesel	TBC	TBC	Portfolio
Imperial Gas 92	Oct-17	3,800	Imperial Logistics International BV & Co. KG	Centromost	Germany	Diesel	Cylinder	TBC	Portfolio
Imperial Gas 93	Nov-17	3,800	Imperial Logistics International BV & Co. KG	Centromost	Germany	Diesel	Cylinder	TBC	Portfolio

Fleet – Small-scale/Multipurpose

Name	Built	Capacity	Registered Owner	Builder	Flag	Engine Type	Cargo System	No. of tanks	Project
Akebono Maru	Jun-11	3,500	Chuo Kaiun K.K.	Higaki	Japan	Diesel	Cylinders	2	Japan coastal trade
Aman Sendai	May-97	18,928	Asia LNG Transport	NKK	Malaysia	Steam	TZ Mk. III	3	Malaysia LNG
Coral Acropora	Dec-12	6,573	Coral Acropora Shipping	AVIC Dingheng	Netherlands	Gas-Diesel	Cylinders	4	Portfolio
Coral Actinia	Jan-13	6,573	Coral Actinia Shipping	AVIC Dingheng	Netherlands	Gas-Diesel	Cylinders	4	Portfolio
Coral Alicia	Dec-12	6,573	Coral Alicia Shipping	AVIC Dingheng	Netherlands	Gas-Diesel	Cylinders	4	Portfolio
Coral Anthelia	May-13	6,500	Coral Anthelia Shipping	AVIC Dingheng	Netherlands	Gas-Diesel	Cylinders	4	Portfolio
Coral Energice	Feb-18	18,000	Anthony Veder Chartering	Neptun Werft	Netherlands	Gas-Diesel	TZ MK. III Flex	2	Portfolio
Coral Energy	Dec-12	15,600	Anthony Veder Rederijzaken	Meyer Werft	Netherlands	Gas-Diesel	IMO Type C	3	Portfolio
Coral Favia	Jul-10	10,000	Somargas II Pvt. Ltd.	Wuzhou Shipbuilding	Singapore	Diesel	Cylinders	2	Baltic portfolio
Coral Fraseri	Jan-10	10,000	Innovation Shipping Co.	Wuzhou Shipbuilding	Singapore	Diesel	Cylinders	2	Portfolio
Coral Fungia	Jan-11	10,000	Somargas II Pvt. Ltd.	Wuzhou Shipbuilding	Singapore	Diesel	Cylinders	2	Baltic portfolio
Coral Furcata	Nov-11	10,000	Conception Shipping Company	Wuzhou Shipbuilding	Singapore	Diesel	Cylinders	2	Portfolio
Hai Yang Shi You 301	Apr-15	30,000	COSL	Jiangnan Shipyard	China	Gas-Diesel	Membrane	4	Hainan LNG shuttle
Kakurei Maru	Nov-08	2,536	Tsurumi Sunmarine Co.	Higaki	Japan	Diesel	Cylinders	2	Japan coastal trade
Kakuyu Maru	Nov-13	2,538	Tsurumi Sunmarine Co.	Kawasaki	Japan	Diesel	Cylinders	1	Japan coastal trade
Lucia Ambition	Dec-93	18,927	Asia LNG Transport	NKK	Malaysia	Steam	TZ Mk. III	3	Malaysia-Hainan
North Pioneer	Nov-05	2,500	Japan Liquid & Gas Transport Co. & Japan Railway Agency	Shin Kurushima	Japan	Diesel	Cylinders	2	Japan coastal trade
Pioneer Knutsen	Mar-04	1,100	Knutsen Kyst LNG K/S	Bijlsma Lemmer B.V. Scheepswerf	Norway	LNG-Diesel	Cylinders	2	Norway coastal trade
Ravenna Knutsen	Feb-21	30,000	Norspan LNG 14 AS	Hyundai Mipo	Spain	X-DF	Cylinders	3	Italy coastal trade
Seoul Gas	Jul-98	4,365	Chemgas Schiffahrts GmbH & Co. mt Oste KG	Severnav Shipbuilding	Liberia	Diesel	Cylinders	2	S. Korea-China
Shinju Maru No. 1	Aug-03	2,538	JRTT & NS United Coastal Tankers	Kawasaki	Japan	Diesel	Cylinders	2	Japan coastal trade
Shinju Maru No. 2	Oct-08	2,536	Chuo Kaiun K.K.	Higaki	Japan	Diesel	Cylinders	2	Japan coastal trade
Sun Arrows	Sep-07	19,531	Maple LNG Transport Inc.	Kawasaki	Bahamas	Diesel	Moss	3	Malaysia LNG
Surya Aki	Feb-96	19,538	MCGC International Limited & Hiroshima Gas Co.	Kawasaki	Bahamas	Steam	Moss	3	Thanlyin LNG
Triputra	Dec-00	23,097	Nusantara Shipping	NKK	Indonesia	Steam	TZ Mk. III	3	Pertamina Portfolio
Unikum Spirit	Jun-11	12,000	DHJS Hull No.2007-001 LLC	AVIC Dingheng	Singapore	Diesel	Cylinders	2	Kuantan
Vision Spirit	Sep-11	12,000	I.M. Skaugen Marine Services	AVIC Dingheng	Singapore	Diesel	Cylinders	2	Portfolio

Any observations, additions or suggested revisions to the LNG journal World LNG Carrier Fleet list should be sent to editor@lngjournal.com



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