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Argentina's unrelenting ambition to become an established LNG exporter

Argentina has had a somewhat troubled relationship with natural gas. However, despite its first attempt at LNG exports lasting less than a year, the country remains determined to re-enter the LNG export market, our Markets Editor Alexander Wilk reports.

Argentina has struggled to gain a permanent foothold in the global LNG market as an exporter. Things started off well in 2019 as the country began shipping its first batch of cargoes from the Tango FLNG barge. However, the coronavirus pandemic hit the Argentinian economy - including the gas sector - hard with lost trade and worker shortages. Amid falling LNG prices in 2020, national hydrocarbon champion YPF issued a force majeure notice for Tango. Still, the Argentinian government remains keen to establish the country as a permanent LNG exporter and has launched a technical study as domestic shale gas production is expanding amid higher prices both domestically and abroad. Undoubtedly, the country has potential as an LNG exporter, with rising production previously having driven down the necessity for imports alongside some seasonal surplus production, but a protracted economic crisis and an insufficient pipeline network is holding back investment.

Initial Attempt

Argentina's first foray into exporting LNG was with a floating liquefaction terminal in 2019 when it reportedly targeted sales to Asia but only exported to Brazil and Europe, our data show. The shipments comprised surplus production during the warmer months of October to April, when heating demand typically declines by around 45 percent.

State-owned YPF was keen to monetise excess supply growth from shale gas production at the Vaca Muerta play to improve its trade balance and place development on a more sustainable footing. As such, the company hoped to reach markets further afield via the LNG route. The Tango FLNG project was intended to be the country's first step on



that journey, with a much larger liquefaction plant (20-25mpta) on YPF's drawing board.

Tango FLNG was commissioned in June 2019 on a ten-year contract with YPF in September 2019. During the course of its employ in Argentina, the floating LNG unit was an important cash generator for vessel owner Exmar and contributed 36 percent to total Exmar EBITDA for the first quarter of 2020.

Tango FLNG, delivered from a Chinese shipyard with financing from the Bank of China, was installed at Bahia Blanca (formerly an LNG import location) to liquefy natural gas from the Vaca Muerta shale gas play. The barge's nominal liquefaction capacity is 500,000 tonnes of LNG per year. According to our data, the unit operated up to 40 percent above its nominal liquefaction capacity whilst working for YPF, based on a monthly breakdown of total annual capacity.

According to our data, the Tango FLNG facility exported five LNG shipments amounting to more than 600,000m³ during its time in Argentina. We did not detect any unscheduled downtime during that period. Notably, gas liquefaction by Tango was stopped in early May 2020 as Argentina's winter regime took precedence. Argentina's gas demand typically shoots up in winter whilst its production cannot keep pace.

Shipments from the floating terminal were suspended in 2020 as gas output dwindled from a high of 144.4 million m^3/d in July 2019 to a low of 114.2 million m^3d in April 2020 in response to low gas prices, staff shortages and a decline in demand during a lockdown in response to the COVID-19 pandemic.

Vaca Muerta

The centrepiece of Argentina's national gas strategy and the main driver for Argentinian LNG exports past and future is the Vaca Muerta play, a huge gas (and oil) shale play in northern Patagonia with around 300 Tcf of gas resources.

"In Argentina we have been blessed with Vaca Muerta," YPF's CFO Alejandro Daniel Lew said at a Platts-reported Americas Society and Council of the Americas energy conference in December 2021. "It is a tremendous resource of shale gas and also of oil."

Development of the Vaca Muerta play began in 2012 after shale gas production had grown rampantly in the United States. Although overproduction and a lack of pipeline infrastructure quickly depressed



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Henry Hub Natural Gas Spot Price (US\$/mmBtu)

US prices at the wellhead, LNG exports became the shale gas industry's saving grace as they broadly stabilised the Henry Hub price.

Recently, US LNG exports were headed for a record high in December on the back of persistent growth in shale gas production seeking lucrative foreign markets. A protracted rise in production from the Marcellus, Permian Basin and other large US shale gas plays has kept US natural gas prices well below those in Europe and Asia. This has incentivised domestic production to find channels to markets abroad where prices are significantly higher.

Whether any long-term plan to emulate the US experience will come to fruition in Argentina will to a large extent depend on foreign direct investment – not only in gas liquefaction infrastructure but also the Vaca Muerta play itself where constant drilling is required to stave off rapid production decline on an individual well level – just like in the United States. The difference, however, is that US drillers, unlike most Argentinian hydrocarbon players, have access to ultracheap debt.

Troubled 2020/21

Faced with declining gas production and limited scope to cover a projected shortfall with regional pipeline supply, Argentina had to swiftly increase its LNG buying ahead of winter 2021 in a bid to avoid a gas crisis. The country issued extra LNG tenders in April that year and boosted LNG imports in May. Argentina required more than one FSRU in operation to manage the required higher gas throughput during the winter period.

The Argentinian government also backed energy champion YPF, which operates the GNL Escobar GasPort facility, to have the suspension of the terminal's operating license lifted by a federal judge. Argentina's only remaining import terminal had been ordered closed in October 2020 on safety concerns.

In his submissions to the court, Secretary of Energy Martínez highlighted 'the urgent need to lift the closure of the Escobar Terminal for LNG Regasification immediately' and warned of potential gas shortages in the upcoming Argentinian winter of 2021 if the terminal was not allowed to operate.

In a report on the 'impact of the nonoperation due to the closure of the Escobar terminal on the provision of natural gas in the country' the government – represented by the Energy Secretariat – alongside state-backed energy company YPF, which operates the FSRU, and other companies and entities involved asserted that there was no risk of an explosion. The federal court accepted the parties' submission and lifted the terminal's suspension.

Argentina's Energy Secretariat is a centralised dependency within the Federal Ministry of Productive Development. The department is the primary regulator of Argentina's energy industry – including hydrocarbons and electricity – in charge of the development and implementation of national energy policy.

Falling domestic production

The reopening of the Escobar terminal in 2021 coincided with the government seeking to boost gas production over the next four years. National gas output had decreased by 21 percent to just 114 million m³/d in December 2020 from roughly 144 million m³/d in July 2019, Argentinian LNG Imports & Exports (MMt)

according to data from the Energy Secretariat.

Pipeline imports insufficient

Gas imports via pipeline were unlikely able to cover any domestic supply shortfall. Although state-backed energy supplier IEASA concluded a short-term contract with Bolivian producer YPFB last year, that supply only amounts to a minimum of 14 million m³/d in May-August compared to a previous commitment of c. 18 million m³/d. Bolivian gas production, like Argentina's, has been declining, government data show.

YPF under pressure to clear gas infrastructure backlog

Argentina initially hoped to be able to rely on its Vaca Muerta shale play to not only meet the bulk of domestic demand but also reaffirm its role as a regional gas exporter – both via pipeline and the Tango FLNG project. However, sustained drilling campaigns and repeated largescale investment have not come to pass. The country also lacks sufficient gas storage capacity to bridge seasonal spikes. The only silver lining was that reduced economic activity also led to less gas demand growth, so that expensive LNG imports only saw an uptick, according to our data.

Meanwhile, an extensive infrastructure backlog built up over the past decade is adding to Argentina's capital demands. YPF is pushing to expand gas exports to Chile, where Enel Generación Chile and Colbún respectively signed new supply contracts with YPF over 365mln m³ p.a. and 1.095bln m³ p.a. Previous deliveries, however, have been volatile as Argentina's pipeline capacity struggles to cope at times of high demand, which is both responsible for supply interruptions and LNG imports.



Sources of Argentine LNG Imports (MMt)



economy were also highlighted when YPF was forced to declare force majeure on its Tango FLNG plant in late June 2020. The company sent a force majeure notice to Belgium shipowner Exmar, declaring its inability to pay for the charter of the Tango FLNG unit. According to Exmar, YPF claimed that effects of the coronavirus pandemic both worldwide and in Argentina hindered YPF's ability to perform its obligations under the Tango FLNG agreements.

New Vision

Undeterred by past setbacks, YPF is again conducting preliminary studies to find a path towards rebuilding its LNG export capacity. This approach will have to go hand-in-hand with growing gas production in the country's giant Vaca Muerta shale play. There are also projects underway to increase pipeline capacity, according to Alejandro Lew. "We are doing the technical studies to be prepared," he added.

The vision outlined by Lew would build on Argentina's initial attempt to enter the LNG market as an exporter. However, unlike in 2019 and 2020, domestic gas production has started to recover whilst international spot prices have shot up, encouraging YPF to revive plans for exporting LNG. Moreover, Argentina's period of low demand is when demand is highest in the Northern Hemisphere. "The market was lacking the right price signals for the natural gas resources to be developed," Lew said, adding that the prevailing high price environment has supported production growth.

In the United States, periods of high domestic demand typically coincide with European and Asian high demand periods. There has thus been concern about rising natural gas prices among large US energy users that has resulted in trade group Industrial Energy Consumers of America (IECA) sending a letter to US Energy Secretary Jennifer Granholm last "to take immediate action" to limit LNG exports. "Excessive LNG export volumes are inflationary and threaten the competitiveness of trillions of dollars of manufacturing capital assets, millions of jobs, and economic growth by driving up the cost of natural gas, natural gas liquids feedstock, and electricity," the trade group argued in December last year.

To build on that geographical advantage, the Argentine government is looking to boost gas production as quickly as possible. Drilling activity was slow last year during the lockdown until a price incentives programme kicked in early last year. The government scheme has boosted average domestic gas prices to \$3.50/MMBtu, up from less than \$2.50/MMBtu in 2020.

Yet, to begin to increase exports, production from Vaca Muerta must still grow further together with a concerted push to boost midstream capacity. "The problem is that right now we have some bottlenecks in terms of natural gas pipelines to be able to further increase production out of Vaca Muerta to supply gas during wintertime," Lew said.

The Argentinian government is planning to address these issues by end-2023 with a \$3.5 billion project to increase gas pipeline capacity out of Vaca Muerta by 44 million m³/d. The capacity expansion also includes the construction of a new pipeline. More than half of that new capacity - 24 million m³/d - is due to come online next year, according to the government.

The pipeline project is both demonstrating the government's commitment and boosting expectations that producers will finally be able to develop and harness the Vaca Muerta play for global export markets more extensively.

"We do have the resources and we do have the opportunity down the road to potentially export LNG," Lew said.

Argentina produced 133 million m³/d in in September and 127 million m³/d in October, according to Energy Secretariat data. "The market has increased production by about 30 percent in less than three months," Lew said. "This has demonstrated the ability of Vaca Muerta gas to be efficiently put to work with an average price of \$3.50/MMBtu." However, production thus remains below average annual demand of 120 million m³/d and peak winter (June to August) demand of up to 180 million m³/d. This effectively establishes a minimum production threshold of around 120 million m³ before Argentina can confidently set aside gas for export. Until that time, the country is likely going to continue to import pipeline gas from Bolivia all year and meet peak demand through additional LNG imports during the Southern Hemisphere winter.

Concluding thoughts

With solid government backing and ample gas production potential from Vaca Muerta, little should stand in Argentina's way on the path towards permanent LNG exports. However, apart from highlighting the country's potential, Lew also said he is uncertain when YPF, which produces 28 percent of Argentina's 133 million m³/d of gas, could start a greenfield multibillion-dollar LNG project, given that the country's financial crisis, now in its fourth year, is limiting access to capital at affordable rates.

"With the current macroeconomic environment in Argentina, any multibillion-dollar and multiyear project such as an LNG terminal should probably take a few years to come," he said. "But the opportunity is there."



December trade constitutes continued growth

Our December data show continued growth in LNG flows underpinned by higher American and Nigerian exports as well as continued growth in Far Eastern and European demand, our Markets Editor Alexander Wilk reports.

In December, our data showed global LNG trade had grown by 0.35mmt (1 percent) over the equivalent period in November. Although relatively minor in volume terms, it nonetheless constituted continued supply growth in a tight market. Shipped Atlantic Basin volumes led global LNG export growth with a month-on-month increase of 0.67mmt as the United States returned to high output alongside a boost to Nigerian exports. Concurrently, Qatar's output remained high, but showed only marginal monthon-month growth whilst Malaysia and Australia reduced exports.

Meanwhile, December's global LNG demand - both in terms of growth and total volume - was underpinned by the Far East with the fastest growth in Japan. Concurrently, China and South Korea also saw sustained high demand. Europe saw more moderate increments in volume terms, but which were nonetheless significant in their sum. Demand in the Middle East, however, was seasonally low, as only Pakistan continued with broadly steady imports.



Exports

Our December data show global exports grew by 0.35mmt (1 percent) month-onmonth, slightly slower than in November when volumes had grown by 0.67mmt (2 percent). Export growth by volume was led by the Atlantic Basin, where overall

Market Share & LNG Exports by Country (MMt)



shipped volumes were up 0.59mmt (5 percent) over November. Concurrently, Middle Eastern shipments were up by 0.15mmt (2 percent) month-on-month. Pacific Basin exports, however, saw negative growth as regional flows decreased by 0.39mmt (-3 percent). This, in turn, translated to global full-month exports of 33.11mmt in December compared to 32.76mmt in November. Accordingly, December's LNG shipments were also up 1.95mmt (6 percent) year-onyear.

Pacific Basin

Pacific exports reached 12.67mmt in December, coming in below November's volume of 13.06mmt by 0.39mmt (-3 percent). Consequently, annualised capacity utilisation stood at 94 percent.

Australia

In line with the Basin's overall negative export growth, the region's most significant exporter by installed capacity – Australia – decreased exports by 0.39mmt from 6.96mmt in November to 6.76mmt in December. Our data indicated export growth of 0.22mmt (20 percent) at NWS LNG was leading the continent's onshore plants in December. NWS LNG exported 1.32mmt compared to the 1.10mmt recorded in November. Exports from Darwin LNG, meanwhile, increased by 0.09mmt (43 percent) from 0.21mmt to 0.30mmt. This was followed by Queensland Curtis LNG, where at 0.79mmt shipments were also up by 0.09mmt (13 percent) from 0.70mmt in November. Ichthys LNG, meanwhile, grew exports by 0.04mmt (6 percent) to 0.77mmt in December from 0.73mmt in November. Exports from the remaining Australian onshore plants, however namely Pluto LNG, Gladstone LNG, Wheatstone LNG, Gorgon LNG and Australia Pacific LNG – came in below their exports in November. Shipments from Pluto LNG in particular trailed their November equivalents of 0.40mmt by 0.13mmt to reach only 0.27mmt by the end of the month. The remaining onshore plants showed an overall month-onmonth reduction of 0.31mmt (-9 percent).

Shell's Prelude FLNG barge, meanwhile, was not seen in the market, having exported 0.20mmt in November. Our data and calculations indicated the facility had operated at around 63 percent of annualised capacity in November. Following another power issue at the facility in December, Shell was again forced to suspend production and evacuate staff whilst the plant was in the process of increasing exports.

Southeast Asia

North of Australia, Papua New Guinea's PNG LNG saw month-on-month shipments decrease slightly by 0.03mmt (-4 percent) to 0.72mmt in December compared to 0.75mmt in November. PNG LNG lost market share in South Korea and Japan in December, which was only



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partially compensated by additional exports to China and Taiwan. At 127 percent, however, the plant continued to operate at above nameplate capacity.

In neighbouring Indonesia the amount of LNG shipped had increased marginally, up by 0.03mmt (2 percent) to 1.35mmt in December compared to the 1.32mmt recorded in November. Notably, the Bontang plant had reduced output to 0.44mmt in December, having exported 0.57mmt in November. However, Donggi-Senoro LNG increased shipments by 0.03mmt (21 percent) to 0.17mmt from 0.14mmt in November. The Tangguh LNG facility also increased shipped LNG volumes by 0.13mmt (21 percent) from 0.61mmt to 0.74mmt.

Meanwhile, Malaysia saw monthly shipments decrease noticeably from its FLNG facilities PFLNG Satu and Dua, where combined cargo volumes were down 0.14mmt (-40 percent) from 0.14mmt in November to 0.07mmt in December and 0.21mmt in November to 0.14mmt in December, respectively. A modest increase of 0.01mmt (1 percent) from 1.83mmt to 1.84mmt at Bintulu could thus not compensate. Accordingly, Malaysian LNG shipments decreased by 0.13mmt (-10 percent) to 2.05mmt in December from 2.18mmt in November. Petronas has been reported to have warned buyers of a supply impasse potentially lasting into March 2022. Having issued downward quantity tolerance (DQT) notices, the country went on to grow exports briefly but could not sustain that growth in December. Meanwhile, Brunei had kept monthly LNG exports steady at 0.48mmt.

Russia & Peru

Elsewhere in the Pacific, Russia's November.



S. America, 0.64





shipments as it had done in previous In contrast to

months. The plant's exports amounted to

0.95mmt, down by 0.03mmt (-2 percent)

from 0.98mmt in November. December's

performance was due to significantly less

market share in South Korea and Taiwan,

where an overall decrease in offtakes

from Sakhalin by 0.40mmt (-66 percent)

effectively negated even a significant

increase of 0.30mmt in Japan. Sakhalin

flows to China also reoccurred with an

export of 0.07mmt. There were no

shipments from Sakhalin to China in

November. Meanwhile, Peru's Pampa

Melchorita also did not see continued

export growth in December as shipments

were down slightly by 0.04mmt (-3

percent) to 0.36mmt from 0.40mmt in

de East, 1.01

China, 7.71

Taiwan, 1.73

In contrast to the Pacific, the Atlantic Basin's overall shipped LNG had increased by 0.67mmt (6 percent) monthon-month to 12.27mmt in December from 11.60mmt in November. This translated into annualised export capacity utilisation of 85 percent.

North Africa & Europe

5. Korea, 4.01

The overall amount of LNG exported within the north-eastern part of the Atlantic – comprising the European Union, Russia and North Africa (and not including re-exports) – had again seen a significant net decrease of 0.13mmt (-5 percent) month-on-month. The ongoing outage at Snøhvit LNG in Norway still weighed on the eastern Atlantic's overall exports, alongside a significant net

decrease of 0.09mmt (-9 percent) in Algeria. Skikda decreased LNG exports by 0.08mmt (-28 percent) month-onmonth to 0.21mmt whilst output from Arzew remained broadly steady at 0.61mmt. This contributed significantly to the net negative result for the North Africa-Europe region. Monthly shipments from Russia's Yamal LNG had also decreased by 0.04mmt (-2 percent) in December as a continued significant downturn in exports to the Far East was only partially compensated by higher shipments to the European Union, led by Belgium. Although Yamal LNG's shipments to China were up by 0.02mmt (17 percent), exports to Japan, South Korea and Taiwan had vanished. These shipments had amounted to 0.29mmt in November.

West Africa

Japan, 7.07

Meanwhile, West African exports were up by 0.37mmt (20 percent) as Nigeria, in particular, increased shipments to 1.46mmt in December following exports of 1.20mmt in November. Apart from Nigeria, West African export growth was also seen in Cameroon, where we recorded an increase of 0.08mmt (114 percent) from 0.07mmt to 0.15mmt. Additionally, there was more modest export growth in Equatorial Guinea and Angola. The former increased shipped LNG volumes by 0.02mmt (7 percent) to 0.29mmt whilst the latter grew exports by 0.01mmt (3 percent) to 0.34mmt. West African exports benefitted from higher Indian and European demand, which

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Source: LNG Journal

compensated for demand reductions in China and Taiwan.

Americas

Exports from the US Gulf Coast had continued to see significant month-onmonth growth of 0.39mmt (6 percent) to 6.90mmt in December from 6.51mmt in November. Our data indicated the export increase was mainly due to considerably higher exports of 0.55mmt (57 percent) to 1.51mmt by Freeport LNG. Together with export growth totalling 0.23mmt at Elba Island LNG and Cameron LNG, this compensated for a combined export decrease of 0.39mmt (-9 percent) at Corpus Christi LNG, Sabine Pass LNG and Cove Point LNG. Whilst the reduction at Corpus Christi was relatively minor at 0.09mmt (-7 percent) to 1.28mmt, Sabine Pass and Cove Point together shipped roughly four cargoes less in December.

In South America, Atlantic LNG in Trinidad & Tobago had seen exports increase by 0.04mmt (8 percent) to 0.55mmt in December compared to the 0.51mmt we recorded in November. Atlantic LNG shipments continued their focus on Europe whilst also pivoting back to the Caribbean and North America. Exports to the Far East, however, decreased by 50 percent to 0.13mmt.

Middle East

Alongside higher month-on-month Atlantic Basin exports, shipments from Middle Eastern plants had increased by 0.15mmt (2 percent) from 8.10mmt in November to 8.25mmt in December. Accordingly, our data showed the Basin's overall utilisation of operational export capacity (i.e., excluding Yemen) to stand at 94 percent by the end of December.

As in November, month-on-month export growth in the region was not underpinned by higher exports from Egypt. Instead, the country's shipments by its Idku LNG plant were down 0.08mmt month-on-month. They thus had decreased by 15 percent from 0.53mmt to 0.45mmt. Neighbouring Damietta LNG, meanwhile, had increased exports by 0.08mmt (62 percent) to 0.21mmt from 0.13 at the time of writing. Overall, Egypt thus kept exports steady at 0.66mmt in December. Although exports to the Far East slumped by 0.28mmt (-85 percent) as demand for Egyptian gas in China, Japan, South Korea and Taiwan vanished - exports to Continental Europe grew by 0.16mmt in total, led by France and Greece. There were also shipments to



Source: LNG Journal

Kuwait and Thailand as well as one cargo aboard the Sestao Knutsen that still had to declare its destination in the Pacific.

Concurrently, Qatar had stabilised exports at 6.17mmt, following a significant month-on-month reduction to 6.12mmt November. in Notably, shipments to North Europe had continued to decrease. They were down by 0.40mmt (-67 percent), partly because exports to the United Kingdom once again did not transpire in December. Concurrently, Belgian and Polish imports of Qatari gas had decreased by 0.26mmt and 0.10mmt, respectively. There were also fewer exports to the Far East, led by Japan, which were down 0.48mmt (-55 percent) whilst exports to South Korea were also down by 0.10mmt in December. However, strong growth in shipments to Bangladesh, India, Pakistan and Kuwait totalling 0.59mmt were instrumental in compensating.

The country's fellow Persian Gulf producers in Oman and the UAE also saw overall monthly exports grow by 0.10mmt (14 percent). The growth of 0.10mmt was split evenly between the two in volume terms. Higher exports to Taiwan and South Korea compensated for lower demand in China, Japan and India to constitute net growth for the month. Of the two Persian Gulf producers, Oman managed to increase exports by 0.05mmt (6 percent) to 0.88mmt in December. The UAE's Das Island plant, meanwhile, grew shipments by 0.05mmt (10 percent) to 0.54mmt.

Imports & Domestic Trade

Global LNG imports equally saw a robust

month-on-month increase in December, whereby the Pacific Basin led demand growth whilst in the Atlantic Basin imports grew more moderately and continued to retreat in the Middle East. had increased steeply by 2.69mmt (12 percent) in December as Japan grew offtakes by 1.38mmt (24 percent) to 7.07mmt. This was followed by demand growth of 0.71mmt (10 percent) to 7.78mmt in China. Meanwhile, South Korea had increased imports by 0.32mmt (9 percent) to 4.01mmt in December. India

Pacific Basin

Month-on-month Pacific Basin imports

Market Share & LNG Imports by Country (MMt)



Source: LNG Journal

had also seen monthly demand increase by 0.24mmt (15 percent) to 1.85mmt in December. Elsewhere, in Southeast Asia, Malaysia's offtakes increased by 0.02mmt to 0.21mmt (11 percent). As another sign of seasonally high demand throughout the Pacific, negative growth comprised relatively small reductions (in volume terms) in Indonesia and Taiwan, totalling 0.08mmt.

In line with net Pacific demand growth, the roster of typically priceconscious Pacific buyers – including Bangladesh, Thailand, Chile, Mexico, Singapore and Myanmar – collectively saw imports net increase by 0.18mmt (13 percent) in December. This was primarily due to Singapore having imported 0.08mmt (22 percent) more alongside a rare import of 0.07mmt in Mexico via the Energia Costa Azul terminal as well as an extra cargo each in Chile and Bangladesh. These increases totalling 0.26mmt were only tempered by a decrease in offtakes by Thailand, which saw imports amount to 0.48mmt in December, down 0.08mmt (-14 percent) month-on-month. Meanwhile, Myanmar continued its market absence.

Atlantic Basin

LNG imports in the Atlantic Basin grew by 0.61mmt (7 percent) to 8.93mmt in December from 8.32mmt in November, with annualised capacity utilisation at 39 percent.

A sharp increase in European offtakes was a primary factor in overall import growth – led by Turkey, France and Greece – which together had grown imports by 0.98mmt (44 percent) to 3.23mmt. In addition, other European



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importers ranging from the Netherlands to the United Kingdom and Lithuania took in 0.51mmt (16 percent) more in December, including 0.06mmt and 0.04mmt by Malta and Lithuania, which did not import LNG in November. Meanwhile, Italy and Poland kept monthly imports broadly steady at 0.38mmt and 0.33mmt, respectively. However, these increments were tempered by offtake reductions totalling 0.20mmt (-22 percent) to 0.70mmt in Croatia, Belgium and Portugal.

As to demand in the western Atlantic, importers in the Caribbean and South America - including Brazil, Jamaica, Puerto Rico and the Dominican Republic saw monthly net LNG demand decrease by 0.28mmt (-27percent) to 0.74mmt in December from 1.02mmt in November. Brazil remained the region's key importer in December, even as the country decreased offtakes by 0.20mmt (-29 percent) to 0.49mmt from 0.69mmt in November. December also saw negative demand growth of 0.07mmt (-37 percent) in the Dominican Republic to 0.12mmt whilst demand in Panama and Jamaica, which was 0.01mmt in both countries in November, vanished. Argentina and Colombia were also not seen in the market in December, having last imported 0.14mmt and 0.02mmt in September, respectively. As such, only Puerto Rico showed LNG demand growth in the Caribbean in December, up by 0.01mmt (8 percent) to 0.13mmt. Finally, there was some LNG demand in the United States with offtakes of 0.05mmt, up 0.03mmt (150 percent) month-on-month whilst Canada did not take in a cargo.

Middle East

In contrast to the Pacific and Atlantic Basins, Middle Eastern LNG demand slackened by 0.17mmt (-14 percent) to 1.01mmt in December from 1.18mmt in November. In October, offtakes had amounted to 1.58mmt. Regional offtakes suffered from a slump in Kuwaiti imports by 0.20mmt (-43 percent) to 0.27mmt. Meanwhile, Dubai's FSRU was not seen in the market, which left a relatively modest month-on-month increment of 0.03mmt at Pakistan's Port terminal as insufficient to compensate. As was the case in November, Israel's Hadera FSRU terminal was again not seen in the market whilst Jordan's LNG terminal also continued its market absence. Accordingly, the Middle East's annualised import capacity utilisation stood at only 25 percent in December.

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SIGTTO discusses IMO greenhouse gas rules

The gas shipping industry's body, the Society of International Gas Tanker and Terminal Operators (SIGTTO), held its first face-to-face Board and 42nd Annual General Meeting (AGM) since COVID-19 on 18th November, 2021. Technical Editor Ian Cochran reports.

This event was sponsored and hosted by Naftomar Shipping & Trading.

At the meeting, governance, finance, policy, the road to net-zero strategy and the carriage of non-hydrocarbon gases as cargoes were discussed and a Bye-Laws amendment was approved to reflect SIGTTO's role in the environment.

Working closely with the IMO, SIGTTO has been heavily involved with the Energy Efficiency Existing Ship Index (EEXI), de-carbonisation, and CO2/LH2 shipping. An environmental subcommittee was established and the organisation also has working groups involved in the forthcoming revision of the IMO IGC Code.

"It has been a tremendous pleasure to bring back the majority of the board and AGM participants to meet face to face again. SIGTTO are taking speedy steps to address the increasing environmental impact of shipping and to address the safety aspects of use of new technologies. We have expanded our secretariat and at the same time seen an increase in membership." SIGTTO President and Evergas CEO, Steffen Jacobsen, said, "The work of the environmental sub-committee is of high importance and deserves a lot of attention and focus. At the same time, we must address the new challenges of safely handling large volumes of CO2 and liquefied hydrogen to address the new focus areas for a greener industry."

SIGTTO's secretariat has increased from eight persons to 11 since 2020, and

the number of technical projects producing best practices and guidance for the industry has reached its highest in its 42 year history. Echoing the expansion, 11 shipping companies from both the LNG and LPG sectors joined the organisation last year.

Looking ahead, the 65th Panel Meeting is due to take place face-to-face also in Athens on 30th - 31st March, 2022.

"Athens is a great meeting location for SIGTTO considering the number of members we have in Greece," SIGTTO General Manager, Andrew Clifton, commented, "We look forward to returning to the city in March for our 65th panel meeting."

Virtual meeting

Also last year, following the success of its first virtual panel last April, SIGTTO held a second Autumn Virtual Panel in September.

This event involved more than 300 technical professionals, senior managers and directors from SIGTTO's membership, including operators and owners of LNG and LPG terminals, gas shipping companies, port authorities, training organisations, tug companies and class societies worldwide.

In line with the ongoing drive towards energy transition and de-carbonisation, EEXI and the Carbon Intensity Indicator (CII), the regulations for reducing existing ships' carbon impact introduced by the IMO, became the main topic throughout the event.

The proceedings kicked off with a presentation by Hiroyuki Yamada, Director of IMO's Marine Environment Division. He discussed the outcomes of last year's IMO MEPC and MSC meetings, with a specific focus on the adopted amendments to MARPOL Annex VI on the short-term greenhouse gas (GHG) reduction measures (EEXI and CII), lifecycle GHG emissions and relevant safety considerations, including possible amendments to the IGF Code and possible guidelines on hydrogen and ammonia.

A presentation was also given by Howe Robinson Partners, which discussed the LNG shipping market situation as of last September and the prospects for 2022. Lloyd's Register (LR) gave an insight into EEXI compliance and carbon intensity reduction, while CGE Risk highlighted the approach to risk management using the bowtie methodology. In addition GTT outlined the current practice of green gas trials and the commissioning of LNGCs.

Bernhard Schulte Shipmanagement (BMS) shared the lessons learned from the explosion and fire on board the LPG carrier 'Syn Zania', while the Keil Centre explained best practice with a practical application and a focus on human factors in incident investigation. Bureau Veritas (BV) outlined its technical guidelines and projects for CO2 shipping and Shell passed on its experience of deploying air lubrication systems.

Delegates were also updated on the



Tug owner SAAM was one of the companies to join the society last year

SIGTTO head Andrew Clifton

various working group projects being carried out by SIGTTO, and General Manager, Andrew Clifton's insights on hydrogen shipping.

The whole Autumn event echoed the previous SIGTTO Virtual Panel's agenda in sharing best practices on different solutions to achieve emissions reductions in the context of EEXI and CII.

Some past presentations and discussions included those on 'Suiso Frontier', the world's first liquefied hydrogen carrier given by HySTRA, technical & commercial challenges of the LNG-to-Powership solution (gas to power) by Mitsui OSK Lines (MOL), the use of LPG as fuel for the main engine of two new Exmar-operated 88,000 cu m VLGCs the design and development and challenges of Very Large Ethane Carriers (VLEC) were explored by ABS.

SIGTTO meetings are free to attend or view and have no limit to the number of registrations from each member company. The society explained that this initiative was to equip its members with the ability to reach operational excellence and produce best practices and guidelines for the gas shipping industry to secure ship safety.

"It is a very challenging and exciting time to be in the industry today," added Clifton, "With COVID-19 safety measures in place, the SIGTTO London office was reopened for members to visit last October."

SIGTTO's membership now covers more than 90% of the world's LNGCs and terminals and over 50% of the LPG market, the society said.

Arctic shipping's ice load monitoring to increase

Last year, Russia's Northern Sea Route (NSR) posted its busiest navigation season. Technical Editor, Ian Cochran looks at the risks involved.

Total traffic reached 33.5 mill tonnes by mid-December and was expected to exceed 34 mill tonnes by the end of the month, compared to 33 mill tonnes in 2020 - a rise of 350% over the past five years.

Due to Russia's huge Arctic oil and gas growth, today LNGCs and tankers make up the majority of the NSR's traffic.

Russia is planning to achieve annual traffic of 80 mill tonnes by 2024 and, according to the Kremlin's recently adopted Arctic Strategy, shipments along the NSR will reach 90 mill tonnes by 2030 and 130 mill by 2035.

A warming Arctic is opening up new economic opportunities in the region, as the average ice cover retreats and the average ice thickness declines.

However, these high latitudes still hold unique risks for shipping, as shown by the sudden icing along the NSR in late November last year.

To counter the risk, one company offering ice load monitoring equipment is Oslo-based Light Structures (LS).

LS recently won an order from Samsung Heavy Industries (SHI) to deliver comprehensive ice load monitoring systems for 10 Arctic LNGCs building at Zvezda, in co-operation with SHI, to be operated by Sovcomflot (SCF).

The first of the next generation 172,600 cu m Arc7s was due to be delivered before the end of last year, with six more due in 2022 and the final three in 2023.

Using LNG as a primary fuel, each vessel will produce 45 MW of power, comparable to that of a

nuclear

"We always ask, 'what do you want to monitor' before we start to customise a system for any type of vessel"

icebreaker, to break ice up to 2.1 m thick in temperatures down to minus 52 deg C.

Operating in such extreme conditions, the Arc7s will be subject to powerful dynamic forces that could potentially impact hull integrity and operational safety, but with LS' patented SENSFIB system on board providing uninterrupted real-time ice load monitoring and alerting, the Masters and navigators can make informed decisions based on live structural stress data, the company claimed.

SENSFIB has already been proven on Arctic routes, following its installation on the first icebreaking Arc7, 'Christophe de Margerie'.

The systems fibre optics technology is based on Fiber Bragg Grating (FBG), a solution that delivers more accurate data while reducing cost and complexity when compared to less resilient electromechanical systems.

Uniquely, SENSFIB sensors are installed using an adhesive, negating the need for any welding and with no moving parts, users can save the cost of annual recalibration required by electromechanical systems. LS' solution is also EX and ATEX approved, making the system suited to hazardous environments, such as those found on LNGCs.

"We're delighted to receive such an extensive order for our SENSFIB ice-load monitoring technology, especially as it reflects the long-standing and positive working partnership we have with SHI," said Niklas Hallgren, LS' CEO. "The contract also shows that leading shipyards and owners are willing to invest in precision structural stress monitoring

> due to safety and operational advantages, despite the lack of any regulations forcing the use of such technology."

Arctic LNG 2

In conversation CCO, LS Terje Sannerud, LNG Journal was told that the will newbuildings make up the majority of fleet the needed to transport NOVATEK's Arctic LNG 2 project's gas through the



SENSFIB's capabilities can clearly be seen in this screenshot

NSR, including the eastern part, all year round from 2023 onwards. Despite their size, there is no official

regulation that mandates the installation of ice load monitoring systems on these ships, or indeed any other vessels, the company said.

All of the major classification societies provide guidance on how to arrange ice load monitoring sensors, however they leave the scope of monitoring to the owner or operator in collaboration with hull designers and equipment suppliers.

"In this context, we have created a customised solution for Arc7 vessels to provide warnings and critical decision support information to provide operational safety during ice navigation under even the most extreme conditions," Sannerud said.

He also explained that the company can deliver systems for all ice load monitoring levels. This depends on rules and regulations of which there are little, class notation and just as important, the owner's expectations.

"We always ask, 'what do you want to monitor' before we start to customise a system for any type of vessel," Sannerud explained.

"We have proven our technology and solutions within ice load monitoring for a decade with a good number of deliveries. We expect a higher demand for Light Structures proprietary technology and solutions, due to our specialist experience in combination with maritime Arctic operations.

"We also see the potential for a strong retrofit market, considering that our use of fibre optics means that SENSFIB systems are extremely easy to install, without the need for any welding at all," he added.

LS was founded in 2001 as a spin-off from the Norwegian Defence Research Establishment and is now established as a leading provider of turnkey fibre optic stress and fatigue monitoring systems based on FBG technology.

More than 300 SENSFIB systems have been installed globally for different applications, vessels and customers. The SENSFIB range includes diverse solutions that can be customised for specific applications, such as hull stress monitoring, FPSO monitoring, ice load monitoring, sloshing monitoring, plus the customised HullInfo application.

In addition to real-time operational data for decision support on board, the system also provides data for active fatigue management reports, which can contribute to reducing operating costs and extending a vessel's lifetime.

Data from the systems is available on dedicated user terminals, through integrated automation and control systems, and as part of IoT networks and cloud-based operational platforms.

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Blended fuels to support cleaner LNG bunker infrastructure

Rising production of biomethane promises to drive a new wave of LNG fuelling infrastructure this year as policy changes support increased uptake. Fuelling Editor Malcolm Ramsay has more.

Long seen as a costly and niche alternative to natural gas, biomethane has risen up the agenda over the last two years as climate challenges have entered the mainstream. New forecasts from consultancy firm Guidehouse now suggest biomethane production in continental Europe will hit 110 terrawatthours by 2040 but still fail to meet demand, which is likely to exceed 140TWh in the same period.

Saunak Rai, general manager of LNG bunker supplier FueLNG, notes that there are "significant quantities of sustainable biomass available that can be tapped to produce biomethane for shipping... but only a fraction of this potential is used today", adding that blending bioLNG with LNG will "further extend the compliance runway against IMO's CII and Poseidon Principle's AER requirements".

Cross-border trade

Rai believes that regulatory policy changes and carbon taxes can help make liquefied biomethane more affordable and energy efficient. At present, many countries and regions restrict the free trade of biomethane cargoes or impose swingeing tariffs but industry support is slowly changing this.

Reinforcing this ambition is the Gas for Climate consortium which includes ten major European gas transport companies, united by a desire to drive sustainable infrastructure and support fuelling and energy solutions.

Launched in 2017 the consortium includes: DESFA, Enagás, Energinet, Fluxys, Gasunie, GRTgaz, ONTRAS, Open Grid Europe, Snam, Swedegas, and Teréga) and two renewable gas industry associations - Consorzio Italiano Biogas and European Biogas Association.

"EU policy must be strengthened to effectively foster a fully integrated energy system," Han Fennema, CEO of Dutch network operator Gasunie, said, calling on policymakers to make gas infrastructure "future proof" and foster cross-border trade of hydrogen and biomethane through a "well-functioning Guarantee of Origin system."

The consortium has also targeted a 'binding mandate' for 10% gas from renewable sources by 2030, to stimulate production and ensure that stocks are widely available for a seamless transition to lower carbon profiles for transport operators.

The alliance predicts that the majority of diesel and marine-oil fuelled vessels will be replaced by bioLNG by 2050 and bioLNG demand in the shipping industry will reach 461 terrawatthours by that date, in comparison to 124 terrawatthours for electric-powered vessels. Long-haul shipping will utilise the lion's share of fuel capacity, requiring 327 terrawatthours of bioLNG fuel by 2050.

GHG framework

Also supporting a transition to bioLNG or



LNG refuelling nozzle



BioLNG tanker

blended LNG solutions is the International Group of Liquefied Natural Gas Importers (GIIGNL), which recently called for regulators to provide more clarity over the sustainability and classification of various LNG cargoes, dependant on the source feedstocks.

"We decided to develop a common approach to the reporting and certification of GHG emissions associated with LNG cargoes. The main objective is to increase transparency on GHG emissions," GIIGNL secretary general Vincent Demoury said.

The GIIGNL has also launched its Monitoring, Reporting, and Verification (MRV) and GHG (Greenhouse Gas) Neutral Framework, aimed at creating independently verified cargo data, giving greater confidence to operators seeking to decarbonise their supply chain.

Citing biomethane, synthetic methane and hydrogen as key elements for LNG fuelling over the next decade, Demoury adds "LNG has a great role to play in decarbonising economies [and] I'm convinced that LNG will enable the development of new forms of low or zero carbon fuels."

Rai of FueLNG concurs, predicting that synthetic alternatives will become increasingly important in the longer term, as production from industrial facilities, powered by renewable energy, scales up.

"All synthetic alternative fuels including liquified synthetic methane

(LSM), e-methanol, e-ammonia, liquified H2 require significant amount of H2 to be available at scale economically," Rai states, adding that technological challenges remain to enable such fuels to be produced economically, meet the safety requirements for bunkering and to enable the necessary infrastructure to be developed before they can replace current fuels.

"This is anticipated to take more than one decade so whilst the industry players develop the solutions, LNG is still the only fuel that can deliver an immediate reduction in emissions today," Rai explains.

FueLNG is a licensed LNG bunker supplier in Singapore and provides solutions for both LNG bunkering and LNG distribution. The firm is a joint venture between Keppel Offshore & Marine and Shell Eastern Petroleum.

The firm recently announced plans with Keppel to undertake small-scale LNG bunkering for vessels in Singapore, utilizing Keppel O&M's Floating Living Lab (FLL), with operations scheduled to commence in Q4 2022.

"FueLNG Bellina will carry out the LNG loading operations into the 3750m3 Type-C storage tank onboard the FLL," Rai explains. "This LNG will then be used to bunker dual-fuelled harbour crafts and small to mid-sized vessels, such as harbour crafts, offshore supply vessels, enabling FueLNG to serve more vessels requiring LNG as a marine fuel."



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For the Record

AUSTRALIAN energy safety authorities are investigating the cause of a fire that shut down Shell's floating liquefied natural gas production vessel, "Prelude", deployed offshore northwest Australia after an incident in which no one was reported hurt.

The FLNG vessel with 3.6 million tonnes per annum of capacity was shut on Friday December 3 after a fire started in an electrical utility at 11pm on Thursday night.

Shell's "Prelude" is moored 400 kilometres north of the town of Broome on Western Australia's Kimberley coast.

The authorities said that around 200 people were on board the "Prelude" when the fire broke out and most had been evacuated.

"A skeleton crew remained aboard while work was being done to restore main power," said Shell.

The spokesperson said the main power was tripped shortly after the fire.

According to Shell, smoke triggered the automatic fire detection and management systems which allowed staff to contain the situation.

"All workers on the facility are safe and accounted for," the Shell statement added.

The cause of the electrical fire is unknown but an investigation has been launched by Shell and the Australian National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) has been informed.

The body NOPSEMA has so far declined to comment on the incident, though confirmed that an investigation was underway.

"Each incident is fully investigated according to the specific circumstances surrounding that event,' added NOPSEMA.

The Shell facility was shut down for 11 months in 2020 after electrical issues and operations only resumed in February 2021 following an "electrical trip" and three incidents which NOPSEMA had described at the time as "dangerous occurrences".

The "Prelude" production hull is the first deployment of Shell's own FLNG technology and comprises a 488-metre long facility. For the Shell project, the Concerto gas field and the nearby Prelude field, with combined resources of around 3 trillion cubic feet, are being used to produce the LNG.

The Prelude joint venture is owned 67.5 percent by Shell and 17.5 percent by Inpex Corp. of Japan, operator of the Australian Ichthys project.

A further 10 percent of Prelude is held by LNG buyer Korea Gas Corp. and 5 percent by CPC Corp. of Taiwan.

The industry's last serious LNG plant fire occurred onshore on September 28, 2020, at the Norwegian Hammerfest facility on Melkoya Island, operated by Equinor.

In the Hammerfest LNG fire report, Equinor and Norway's Petroleum Safety Authority agreed with the conclusion that during a start-up of the facility, a fire occurred in the filter housing of a gas turbine generator.

The investigating groups noted that the cause of the fire was spontaneous ignition in the filters in the turbine's air inlets, caused by excessively high temperatures over a long period of time.

No one was injured in that incident, though the Hammerfest facility suffered smoke and water damage .

The Norwegian plant, which supplies 4.2 MTPA of LNG to European import terminals, is scheduled to re-open in March 2022.

AUSTRALIAN Gas Infrastructure Group (AGIG) was close to starting up the Pluto LNG-to-Karratha Gas Plant Interconnector linking the two LNG export facilities in Western Australia operated by Woodside.

"AGIG is pleased to announce the completion of the Pluto NW Shelf Interconnector. Pre-flow commissioning checks and final inspections were finished," it said.

The Pluto-to-Karratha Interconnector consists of a 30-inch pipeline connecting the inlet facilities next to the Pluto LNG plant, via the metering facilities at Dampier to the outlet facilities within the Karratha Gas Plant, part of the North West Shelf (NWS) LNG project.

"Rehabilitation along the pipeline's right of way has progressed well, with the filling in and positioning of rocks in keeping with the prevailing landscape," explained AGIG.

"The route was carefully chosen and designed in consultation with traditional owners to avoid heritage sites and to meet our environmental obligations, minimising the impact along the right of way," the company added.

AGIG will fill the Interconnector with nitrogen to preserve the pipeline in preparation for Woodside's start of gas flows from the Pluto LNG Plant.

The commissioning and commercial operations are expected to commence in early 2022.

The interconnector will enable Woodside to transport feed gas from the Pluto LNG Plant to the North West Shelf's Karratha Gas Plant for both LNG exports and domestic gas supplies.

The pipeline is just over 3 kilometres in length and will initially transport about 250 terajoules of gas per day and potentially rising to over 900 TJ per day during its operations.

Woodside took a final investment decision on the Interconnector in November 2019 and awarded a construction contract to DDG Operations.

AGIG is also operator of the Western Australia's Dampier-to-Bunbury natural gas pipeline (DBP). This is Australia's longest gas pipeline and has a 1,597km route starting from the Burrup Peninsula in the North West and finishing near Bunbury in the South West.

The pipeline is described by AGIG as "the backbone of the WA energy supply industry" as it links the gas fields in the State's northwest directly to electricity generators, gas retailers and mining and industrial companies.

Beach Energy and Mitsui of Japan have finalized and signed a key commercial agreement with AGIG on their 50-50 Waitsia gas project in the onshore Perth Basin.

The gas will be transported to the NWS LNG plant to enable LNG exports

The Waitsia gas field is ranked as one of the largest gas fields ever discovered onshore in Australia and it is forecast to bring significant economic benefits to the Mid-West region from both the construction and the operating phases.

The Waitsia Stage 2 project includes a new gas processing plant with a 20-year life-cycle that will convey gas via the nearby DBP.

CHEVRON Shipping Company, which has a fleet of more than 30 tankers including 10 LNG carriers as the transportation arm of Chevron Corp., said it had joined the Sea Cargo Charter, a benchmark initiative for responsible shipping activities and transparent reporting as part of the International Maritime Organization's efforts to reduce emissions, especially in ports.

Chevron Shipping said the Sea Cargo Charter was consistent with the policies and ambitions adopted by the IMO, the specialized agency of the United Nations responsible for regulating shipping.

"The Sea Cargo Charter provides a global standard for reporting shipping emissions that advances the decarbonization of the maritime industry," said Mark Ross, president of Chevron Shipping.

"We are excited to join and partner with Sea Cargo Charter to enhance the transparency and accuracy of reporting which will promote responsible environmental performance," added Ross.

The IMO is following policies to reduce emissions from international shipping by reducing the total by at least 50 percent of 2008 levels by 2050.

Chevon Shipping's fleet of LNG carriers serves the US major's global LNG portfolio from LNG plants such as Gorgon and Wheatstone in Western Australia and in Angola in southwest Africa.

The fleet also contains conventional crude and petroleum product carriers.

"We are very pleased to welcome Chevron in the Sea Cargo Charter," said Jan Dieleman, chair of the Sea Cargo Charter Association and president of the Ocean Transportation business of US commodities company Cargill.

"As a large multinational corporation and an oil major, we look forward to their contribution to our shared goal," added Dieleman.

"It is a real pleasure to see another industry leader joining the Charter thus committing to our objective to decarbonize shipping," he stated.

The development of the Sea Cargo Charter has been led by global shippers such as Anglo American, Cargill Ocean Transportation, Dow, Norden, TotalEnergies, Trafigura, Euronav and Gorrissen Federspiel and Stena Bulk.

Some expert support is provided by the Global Maritime Forum, Smart Freight Centre, University College London Energy Institute-UMAS, and law firm Stephenson Harwood.

The Sea Cargo Charter is intended to evolve over time as the IMO adjusts its policies and regulations to the changing environmental landscape.

COSCO Shipping Energy Transportation of China has ordered three liquefied natural gas newbuilds from Hudong-Zhonghua Shipbuilding of Shanghai to take its future fleet

numbers up to 44 LNG vessels.

COSCO gave details in a statement to the Hong Kong stock exchange of the payments plans for the vessels and delivery dates.

The company said that the combined price of the three vessels would be \$554 million.

"The board is pleased to announce that on 7 December 2021, 'United Auspicious LNG', 'United Peace LNG' and 'United Success LNG' (each being a wholly-owned subsidiary of United Liquefied Gas Shipping, an indirect non-wholly-owned subsidiary of the Company) entered into the shipbuilding contracts with Hudong-Zhonghua Shipbuilding and China Shipbuilding Trading," added the statement.

The indirect non-wholly owned subsidiary of COSCO, United Liquefied Gas Shipping, is owned 81 percent by the company and the 19 percent balance is held by PetroChina International.

COSCO currently has an LNG fleet of 41 LNG carriers in total, of which 38 are in operation with a shipping capacity of 6.42 million cubic metres.

COSCO noted that its LNG shipping projects involved two subsidiaries, COSCO Shipping LNG Investment (Shanghai), a wholly-owned subsidiary, and China LNG Shipping (Holdings) of which COSCO has a 50 percent stake.

The newbuilds just ordered each have capacity of not less than 174,000 cubic metres and guaranteed deadweight of 80,000 metric tons at design draught each.

"Pursuant to the shipbuilding contracts, the consideration for each of the vessels is approximately US\$185 million," said COSCO.

"The price of each of the vessels is payable in four instalments of 10 percent, 10 percent, 10 percent and 70 percent, respectively based on the shipbuilding progress," added the company.

COSCO said that the fourth instalment of 70 percent could be adjusted to take account of certain issues such late delivery and performance deficiencies of the vessels.

The company said the cost of the three newbuilds would be funded by the group with 80 percent bank borrowings and around 20 percent from financial resources.

"The delivery of the three vessels is expected to take place on a date no later than 30 September 2024, 31 December 2024 and 31 March 2025, respectively," the statement concluded. **DNG ENERGY,** a Johannesburgheadquartered company, said it arranged the importation of South Africa's first ever consignment of liquefied natural gas in an ISO container.

The company said the ISO shipment was sourced from the Dutch port of Rotterdam and has just been delivered on the Portuguese-flagged container ship "MSC Brittany".

The LNG container was unloaded at Ngqura, a deepwater port on the East Coast of South Africa, 20 kilometres northeast of Port Elizabeth.

The vessel with 9,162 twenty-foot units (TEU) of capacity unloaded the LNG and other containers before proceeding on November 17 to the Port of Durban.

"The development is a precursor to the commissioning of DNG's first floating storage unit delivery in the first quarter of 2022, setting the stage for a new era of growth, competition and sustainability in the energy market," said the company, which also has offices in London, Lagos in Nigeria and Maputo in Mozambique.

The shipping of ISO containers is a part of a growing market for small-scale LNG distribution in Asia, Latin America and the Caribbean.

DNG said it was aiming to push forward with the development of a gas economy in South Africa.

"The arrival of the LNG consignment is an inflection point for South Africa's energy market, marking a key moment in our shift from coal-fired and oil-fired power-generation to cleaner alternatives," said DNG Chief Executive Aldworth Mbalati.

"Along with renewables like wind and solar, the new generation of gas technology brings low-cost power production capabilities to the market on a massive scale," added Mbalati.

"In the context of South Africa's just energy transition, LNG represents an excellent alternative that will help cut greenhouse-gas emissions, reduce air pollution and help combat global warming," he stated.

"It will play a key role in helping the country meet its carbon emission goals and provide power to a growing population," declared the CEO.

DNG said it was taking a first step in contributing to sustainable development in South Africa, by supporting the use of LNG for road and maritime transport, specifically for trucks, buses and ships.

"We look at the LNG value chain in a holistic way, from source to consumption, with ambitious expansion infrastructure plans for South Africa, Mozambique and Nigeria," said Mbalati.

DNG said it had also commissioned South African Shipyards in Durban to build an 8,000-ton LNG barge to be deployed as an import terminal.

The Eastern Cape port of Ngqura is also the centre of plans for an LNG distribution terminal backed by the stateowned Central Energy Fund, which has issued a request for information from interested parties.

The CEF, which is overseen by the Department of Mineral Resources and Energy (DMRE), is mandated to contribute to the security of the energy supply of South Africa.

The closing date for companies to respond to the request has been set at December 3, 2021.

The documents say that a floating storage and regasification unit (FSRU) is the preferred terminal configuration for the facility.

The FSRU's proposed preliminary functional requirements include 170,000 cubic metres capacity of LNG storage and more than 4 million tonnes per annum of regasification capacity.

The preferred FSRU ownership model is to lease or charter a vessel for a 20-year period, along with an operator.

DYNAGAS LNG Partners, the owner of six LNG carriers and with five of them ice-class, has given an upbeat assessment of the cargo market and shipping developments from the safe point of view of all its vessels being on long-term charters.

Dynagas Chief Executive Tony Lauritzen made his points in a postearnings conference call after Dynagas LNG Partners reported third-quarter net income of \$11.3 million, adjusted earnings per common unit of \$0.24 per share and adjusted gross earnings of \$24.8M.

"All six LNG carriers in our fleet are operating under their respective longterm charters with international gas producers," said the CEO.

The Dynagas fleet's main area of navigation with regards to icebound regions are the Northern Sea Route between Norway, northern Russia and Sakhalin Island in the Russian Far East.

The company maintains that the fleet can perform operations in icebound and conventional areas without any significant difference in operating costs and believes its ships have a broader market reach compared with the same types of vessels without ice-class

or winterization features.

"Although we do not have any immediate shipping availability, it is worth mentioning that the third quarter was a very active and healthy gas and shipping market, which is continuing into the fourth quarter," said Lauritzen.

"We have seen a very strong spot market as well as both medium and longterm fixtures concluded at higher levels than what has been reported for the last couple of years," he added.

"The demand for natural gas is driven by several factors, such as renewables producing less power than expected, limited supply of gas to Europe on the back of already low gas storage numbers, a general increase in demand in the Far East as well as typical end-of-thirdquarter stockpiling, preparing for winter heating demand," explained the Dynagas CEO.

"It appears that it is increasingly recognized that natural gas forms part of the solution for lowering greenhouse-gas emissions. In response, we expect to see an increase in new LNG projects and an increase in demand for LNG shipping," declared Lauritzen.

The partnership's fleet of six carriers has an average age of about 11.3 years and the charterers are Norwegian energy company Equinor, Gazprom if Russian and the Yamal LNG plant, operated by Russia's Novatek.

"As of 18th November 2021, the fleet's contracted backlog is about \$1.06 billion, equivalent to an average backlog of about \$177 million per vessel and the fleet's average remaining charter period per vessel is about 7.2 years," said the CEO.

After concluding a new two-year charter contract with Equinor for the vessel "Arctic Aurora", the earliest potential availability will be in the third quarter of 2023 for the same vessel.

The next available vessel after the "Arctic Aurora" may be the "Clean Energy", whose contract expires in 2026.

"Bar any unforeseen events and vessels scheduled dry dockings, our fleet is 100 percent employed for the remainder of 2021, 100 percent for the year 2022 and 96 percent for the year 2023," stated Lauritzen.

ENERGIR of Canada and the Québec Port Authority have completed their 100th liquified natural gas re-fuelling operation as the French-speaking province embraces maritime bunkering, though rejects LNG production for export. "This major achievement is a testament to both companies' leadership to supply the maritime industry in LNG, and to their expertise in bunkering operations in Canada," said Énergir, the main gas distribution company in the province.

The bunkering takes place in or around the port of Québec City, which sits on the Saint Lawrence River and is the oldest Canadian port and the secondlargest after Montreal.

The LNG bunkering station, implemented by Énergir's subsidiary, Gaz Métro Transport Solutions in 2018, is available to all shipowners passing through.

"These 100 LNG bunkers completed at the Port of Québec have supplied five vessels owned by Desgagnés, a Québec shipowner that has shown great vision in adopting LNG as a marine fuel and who also actively participated in the implementation of the bunkering system," said Énergir.

The Desgagnés fleet includes cargo shipping, ferries and tankers with more LNG-powered vessels being added in the future.

Énergir noted that LNG as a maritime fuel was expanding in North. America to meet new emissions standards in ports.

"This solution is one of the concrete actions included in the Port of Québec's Sustainable Development Action Plan, which aims to develop maritime trade by adopting environmentally friendly practices while favoring transitional energy," added Énergir.

"Being one of the best sources of energy available to shipowners on the market, LNG is experiencing significant growth and is recognized elsewhere in the world, particularly in Europe," stated the company.

Energir is also present in the US where it generates electricity from renewable sources, while serving as the leading electricity distributor and the sole natural gas supplier in the northeast US state of Vermont.

EXCELERATE Energy, the US floating LNG import terminal company, is helping to stabilize the flow of supplies to Brazil through 2022 with a deal to deploy one of its existing floating storage and regasification units (FSRUs) to the port of Salvador in the northeast state of Bahia.

Under the agreement with the South American country's state-owned oil and gas company Petróleo Brasileiro, known as Petrobras, Excelerate's FSRU "Excelerate Sequoia" will supply up to 700 million cubic feet per day of regasified LNG.

Through its wholly owned subsidiary, Excelerate Energy Comercializadora de Gás Natural, Excelerate said it expected to sell natural gas to a diverse portfolio of customers in this newly opened market.

"It is both a privilege and responsibility to provide natural gas to Brazil at this critical time," said Steven Kobos, President and Chief Executive of Excelerate.

"Our track record of operational excellence in this market makes us the ideal partner to serve local customers and ensure long-term energy availability and reliability," added Kobos.

"I commend Petrobras for running a transparent tender process as part of the Brazilian government's efforts to open up the Brazilian gas market," he stated.

"We are pleased that 'Excelerate Sequoia', the newest vessel in our industry-leading FSRU fleet, will deliver secure and reliable energy to Brazil," declared Kobos.

Brazil has the largest installed hydropower capacity in South America, with two thirds of the continent's total.

It also relies on LNG in the Southern Hemisphere winter months when power demand surges.

Brazil overtook the US in 2018 as the world's second-largest hydro-power producer by installed capacity after China.

The hydro-power sector makes up twothirds of total Brazilian energy capacity and meets more than three-quarters of electricity demand, though can be unreliable when water levels fall in dams and the rivers feeding the energy assets.

Excelerate is already an experienced player in the Brazilian market having provided FSRU facilities since 2012.

Petrobras has had three terminal locations in Brazil, including Salvador in Bahia, Guanabara Bay in the state of Rio de Janeiro and the port of Pecem in the northeast state of Ceara.

Excelerate's "FSRU Experience" broke an industry record for send-out capacity by reaching 1.06 billion cubic feet at the Guanabara Bay regasification terminal in 2020.

As a leader in flexible LNG regasification solutions, Excelerate has developed and operated 13 LNG terminals to deliver reliable, cleaner energy to markets across the globe.

Excelerate is part of a privately held US energy group founded by American businessman George Kaiser, who is also

the majority shareholder of the publiclytraded Bank of Oklahoma.

FERC, the Federal Energy Regulatory Commission, appointed a new Commissioner, Willie L. Phillips, who was sworn in at the start of December 2021 and took the agency to its full complement of five sitting members.

Phillips was nominated by President Joe Biden in September 2021 and confirmed by the Senate in November.

He replaced Republican Neil Chatterjee for a term expiring on June 30, 2026, and gave the left-wing Democratic Party a 3-2 FERC majority.

"He most recently serving on the Public Service Commission of the District of Columbia (DC), where he has been chairman since 2018 and a commissioner since 2014," said FERC.

"Before being appointed to the DC commission, Phillips served as the assistant general counsel for the North American Electric Reliability Corp.," added the statement.

"He has also worked as a private lawyer, advising clients on regulatory compliance and policy matters and assisting in litigation and administrative proceedings at both the federal and state levels," it added.

Phillips was awarded a doctorate from Howard University School of Law and a bachelor of science from the University of Montevallo in Alabama.

With Phillips officially sworn in, FERC will now move ahead and use its 3-2 majority to pursue FERC Chairman Richard Glick left-wing agenda to impose curbs on the US oil and natural gas industry.

Glick has pushed for change at the agency on a number of issues, including greenhouse-gas emission regulations and what the left-wingers call "environmental justice" in which they take any term and add the word "justice" to the end. This policy will allow people outside of jurisdictions to hold up projects for years.

Glick is also leading Biden Administration efforts to revise and tighten policies before according new permits for natural gas infrastructure.

The other Democratic Partysupporting commissioner is Allison Clements, while Commissioner James Danly and Commissioner Mark C. Christie were Republican appointees.

GECF, the Gas Exporting Countries Forum comprising leading LNG exporting nations and gas producers based in Qatar and known as the OPEC of natural gas, held a virtual ministerial meeting and discussed the prices issue while warnings that over-green policies could lead to energy crises.

The gathering was held under the Chairmanship of Franklin Molina Ortiz, the Minister of Hydrocarbons and Energy of Bolivia.

The GECF has 11 members, including seven LNG producers: Algeria, Egypt, Equatorial Guinea, Nigeria, Qatar, Russia, Trinidad and Tobago, along with pipeline producers Bolivia, Iran, Libya, and Venezuela.

It also has eight observer-status countries, including five LNG nations: Angola, Malaysia, Norway, Peru and the United Arab Emirates, along with Azerbaijan, Iraq, and Kazakhstan.

"The meeting took into account the immediate and long-term outlook for natural gas, which, despite the recent upheavals in the energy markets, remains positive and on course to become the leading fossil fuel in the world by 2050, increasing its share from 23 percent today to 27 percent," said the GECF.

"Ministers noted, that as the global economy moves from under the shadow of the Covid-19 pandemic, the resulting shortage of gas from Europe to Asia demonstrates the need for further investments in natural gas as an abundant and flexible source of energy to achieve energy equality for all parts of the world," the statement added.

As an Observer to the United Nations Framework Convention on Climate Change (UNFCCC), the GECF had urged the international community in the COP26 talks in Glasgow to look to gas as the solution to achieve the right balance between economic and social requirements and environmental constraints.

Furthermore, the GECF member countries acknowledged that decarbonisation of economies should be approached with "careful consideration of hasty acceleration of greening of economies lest the climate agenda turns into an energy crisis."

The GECF noted that high natural gas prices were not in the interest of buyers nor the sellers.

The ministers reiterated their belief in the fundamental role of long-term gas contracts and gas pricing based on oil and gas indexation to ensure stable investments in the development of natural gas resources.

Yury Sentyurin, Secretary General of

the GECF, presented the Management Report of the Secretariat, which included the activities undertaken in the past 12 months.

The ministers also received a preview of the 2021 edition of the GECF's flagship publication, the "Global Gas Outlook 2050", which will be unveiled at the 6th GECF Summit of Heads of State and Government in Doha, Qatar, in February 2022.

"Given technology's pivotal role in transforming the gas industry, the meeting acknowledged the important work that the newly-established Gas Research Institute is set to play in unearthing innovative technologies and other solutions for the benefit of GECF Members and the larger industry," added the statement.

The ministers appointed Tarek El Molla, Minister of Petroleum and Mineral Resources of Egypt as President of the GECF Ministerial Meetings in 2022, and Nikolai Shulginov, Minister of Energy of Russia, as the Alternate President.

Additionally, the ministerial meeting appointed Ms Penelope Bradshaw-Niles from Trinidad and Tobago as the GECF Executive Board Chair.

JERA Co. Inc., the largest Japanese liquefied natural gas buyer, has purchased a significant stake in Freeport LNG at Quintana Island in Texas and will invest in expansions as part of a plan to be able to direct cargoes to Japan even when global supplies are tight.

The Japanese company's USsubsidiary JERA Americas Inc., has concluded а securities purchase agreement with infrastructure fund Global Infrastructure Partners to acquire around a 25.7 percent interest in Freeport for \$2.5 billion.

JERA said in a statement that the acquisition was expected to be completed after the necessary approval and authorization procedures.

For this transaction, JERA appointed US investment bank Goldman Sachs as its exclusive financial advisor and Sidley Austin as its legal advisor.

Brazoria County, south of Houston, and is run by Chief Executive Michael Smith, an energy entrepreneur who developed the plant with almost 15 million tonnes per annum of LNG capacity.

It has use-or-pay liquefaction tolling agreements for most of the output from the three Trains with customers including JERA as well as Japanese utility Osaka

Gas and European-based companies, UK major BP and German utility Uniper.

JERA noted that, together with Freeport LNG, the Japanese company has already contributed to the stable operation of Train 1 of the Freeport liquefaction project through its participation in that subsidiary.

"As a result of the transaction, JERA will not only be involved in the entire existing Freeport LNG project (three Trains with an annual production capacity of approximately 15.45 MTPA) but will also work with Freeport to advance new LNG projects including production capacity expansion and the development of Train 4," explained the Japanese company.

"By leveraging the knowledge and expertise it has accumulated through its global LNG value chain business and power plant operations, JERA will work together with Freeport on its various businesses," added the Tokyo-based company.

JERA as the largest Japanese LNG buyer has 35 MTPA of volumes and controls a fleet of 20 LNG carriers.

Additionally, it is Japan's biggest fossilfuel generator being owned jointly by Tokyo Electric Power Co. and Chubu Electric, the two largest power companies.

The company 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.

"In Asia, there is demand for both decarbonization and a stable energy supply to support economic growth," said JERA.

"As evidenced by the current gas price hikes around the world, securing a stable supply of competitive LNG is becoming increasingly important," stated the company.

JERA added that the new LNG projects planned at Freeport have extremely low development risk due to the use of the existing facilities.

"In addition, since there are no resale or destination restrictions on LNG exported from the project, JERA believes it will be possible to supply LNG to Japan The Freeport plant is located in when supply is tight and to otherwise respond flexibly to the LNG supply and demand situation in the Asian region," declared JERA.

> **KUWAIT** Integrated Petroleum (KIPIC) Industries Co. said all construction has formally been completed at the onshore LNG import terminal at Al-Zour, the largest in the Middle East,

and constructed to provide fuel and power to the refining and petrochemicals industries.

Α \mathbf{South} Korean consortium comprising Hyundai Engineering Co., Hyundai Engineering & Construction Co. and Korea Gas Corp, also confirmed that the project had been executed.

The Hyundai-led consortium won the construction project valued at \$2.9 billion back in 2016 from KIPIC, an affiliate of state-run Kuwait Petroleum Corp.

While the terminal was developed by KIPIC, it is owned by national oil and gas company KPC.

The Kuwait terminal is located about 90 kilometres southeast of Kuwait City and about 16km from Kuwait's border with Saudi Arabia.

It consists of a regasification facility capable of liquefying 130,000 cubic metres of gas per day and eight LNG storage tanks, with four in the first phase, and each with 225,000 cubic metres of capacity.

A statement noted that Hyundai Engineering was in charge of the overall management of the project including design, licensing and the construction of core facilities.

Hyundai E&C was responsible for the building of the LNG storage tanks and reclamation of 7 million cubic metres of land from the sea.

Kogas, the owner of four LNG import terminals in South Korea, conducted test runs through July 2021 when the first commissioning cargo was delivered and since then has run operational training.

The Korean consortium said they shortened the construction period by more than six months even under the restrictions of the Covid-19 pandemic.

"Through the successful completion of this project, we have proved our worldclass LNG plant construction and technological capabilities," said a Hyundai Engineering statement.

Hyundai Engineering added that the LNG facility would provide the Middle East country with a stable gas network to respond to the rising call for energy diversification.

Kuwait already has a 15-year contract with QatarEnergy to buy 3 million tonnes per annum of LNG for the Al Zour facility.

Energy company KPC additionally plans to buy another 3.5 MTPA from the open market or through short-time contracts.

Until recently, Kuwait has imported LNG via a floating storage and regasification unit (FSRU) at the dockside of Kuwait's Mina Al-Ahmadi port. The FSRU has been in operation since 2009.

Oil exporter Kuwait is also focussing on ramping up its own natural gas production as part of its economic growth strategy through to 2040.

The use of LNG in the Middle East is forecast to expand by around 50 percent through 2025, with most of the increase coming from Kuwaiti demand.

Kuwait's domestic natural gas requirements are increasing in line with other Middle East nations and it is already receiving additional deliveries from suppliers such as the US exporters on the Gulf Coast of Louisiana and Texas.

The expansion in infrastructure comes as Kuwait and its neighbour, the United Arab Emirates, are listed 20th and 29th respectively in the list of 42 destinations for shipments from US exporters.

The Gulf Arab economies are among the world's biggest oil consumers on a per capita basis, in part because of the heavy use of crude in their electricity grids.

Analysts note that the state of Kuwait, like the other Gulf Cooperation Council members, is embarking on an ambitious path of economic growth fuelled by more domestic natural gas use and less oil utilization.

Several of Kuwait's neighbours are also trying to phase out oil from their power markets, including the UAE and Saudi Arabia. They are also turning to renewable projects and hydrogen development.

At the same time they must focus on building up their petrochemical and oil exports industries to monetize their resource heritage for the good of their citizens.

MCDERMOTT, the US LNG project engineering and oil and gas developer, has been awarded three prestigious contracts by the Saudi Arabian Oil Company (Aramco) covering four oil and natural gas fields in the Arabian Gulf.

"McDermott continues its decades-long partnership with Saudi Aramco with three new awards for engineering, procurement, construction installation (EPCI) projects," said the Houston, Texas-based company.

In total, McDermott will provide EPCI of four drilling jackets and seven oil production deck modules (PDMs) in Saudi Arabia's Zuluf, Ribyan, Abu Sa'fah and Safaniya fields.

"These awards are a direct result of our

long track record of successfully delivering shallow water infrastructure for Saudi Aramco and our commitments to the growth of Saudi Arabia's energy sector as well as In-Kingdom execution in line with Vision 2030," said Tareq Kawash, McDermott's Senior Vice President for Europe, Middle East and Africa.

In addition to the seven PDMs and four drilling jackets, the scope of work for the three contract release purchase orders (CRPOs) includes EPCI of more than 28 miles (45 kilometres) of pipelines, more than 62 miles (100km) of subsea cables and tie-in works to existing facilities.

"Fabrication is expected to begin in the first quarter of 2022, with offshore installation commencing fourth quarter of 2022 and overall completion expected second quarter of 2023," said McDermott.

Analysts note that several giant oil and gas fields in Saudi Arabia have been producing for years and require multiple stages of brownfield investments to maintain their production profile.

Among the fields Abu Sa'fah is a supergiant offshore oil field located in a maritime area shared by Saudi Arabia and Bahrain.

The field has capacity of around 300,000 barrels per day of Arabian medium crude as well as 370 million standard cubic feet per day of associated gas.

The Zuluf field, a super-giant offshore oil field located about 40km off the northeast coast of Saudi Arabia, is undergoing expansion.

The Safaniya oil field, located 200km north of Dhahran, is one of the largest offshore oil fields in the world, with 37 billion barrels of oil reserves.

In the LNG sector, McDermott won an engineering, procurement and construction (EPC) project in November 2021 after successfully completing frontend design services for a booster compression module for the Australian Ichthys LNG project operated by Inpex Corp. of Japan.

The Ichthys plant came on stream in 2018 and produces almost 9 million tonnes per annum of LNG from two processing Trains, while the Ichthys gas field is offshore northwest Australia and connected to the plant by a 890-kilometre subsea pipeline.

Shares in Ichthys LNG held by Inpex amount to around 66 percent of equity, while French major TotalEnergies has 26 percent. Micro-stakes are additionally held by customers CPC Corp. of Taiwan and Japan's main utilities and LNG buyers, JERA Co. Inc., Tokyo Gas, Osaka Gas, Kansai Electric and Toho Gas.

McDermott was additionally awarded the main engineering contract in mid-2021 from Australian LNG plant operator Santos for the offshore Bayu-Undan infill well that serves the Darwin LNG plant in the Northern Territory.

The EPCI work is for a project in the Timor Sea, located about 310 miles (500 kilometres) off the northwest coast of Darwin and 124 miles (200km) off the southeast coast of Timor-Leste.

NEW FORTRESS Energy Inc., the US company with LNG-to-power projects in South America, the Caribbean and Sri Lanka in Asia, has executed a 15-year natural gas supply agreement in Brazil.

New Fortress signed the deal 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.

New York-based New Fortress 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 400 megawatts of capacity from the second quarter of 2022. "The long-term partnership between

Hydro and NFE will greatly benefit the state of Pará and Barcarena community," said Wes Edens, Chairman and Chief Executive of New Fortress.

"Supply of natural gas from NFE's Barcarena LNG terminal will support Hydro in shifting Alunorte to cleaner fuels and will significantly advance Brazil's energy transition," added Edens.

Under the GSA, New Fortress has agreed to supply Hydro with the equivalent to around 1 million gallons of LNG per day to the refinery from the company's Barcarena LNG receiving and regasification facility.

New Fortress said the conversion from oil-based fuel supply to natural gas will reduce the refinery's annual carbondioxide emissions by an estimated 700,000 tonnes per annum and support Hydro's greenhouse-gas emissions reduction target.

"We are committed to invest in developing the world's largest alumina refinery, and to reduce the greenhouse gas emissions," said John Thuestad, Executive Vice President for Hydro Bauxite and Alumina.

"The fuel switch is a milestone in our sustainability strategy and an important demonstration of our commitment to support local development in Pará state," added Thuestad.

When completed in 2022, New Fortress said that the Barcarena terminal was expected to be the sole point of LNG imports in the state of Pará and the North region of Brazil.

"The terminal will support industrial development and reduce emissions and pollution in the environmentally sensitive Amazon region by providing a cleaner, affordable and reliable alternative to oilbased fuels," New Fortress explained.

In its Asian activities, New Fortress recently agreed to invest in West Coast Power Ltd , the owner of the 310megawatts Yugadanavi Power Plant based in the Sri Lankan capital Colombo while also developing an LNG facility off the coast.

As part of that transaction, New Fortress will have gas supply rights to the Kerawalapitya Power Complex, where 310 MW of power is operational now and an additional 700 MW is scheduled to be built, of which 350 MW will be operational by 2023.

PEMBINA Pipeline Corp., the developer of the Cedar floating LNG project in British Columbia along with the Haisla First Nation, has announced that President and Chief Executive Mick Dilger had stepped down.

The Pembina board said Dilger was leaving to pursue other opportunities and has named Scott Burrows, Pembina's current Chief Financial Officer, as interim President and CEO.

"The board will be working with a leading search firm to identify and evaluate internal and external candidates for a new CEO to lead Pembina in its next chapter," said a statement.

With CFO Burrows taking the interim CEO role, Cameron Goldade, currently Pembina's Vice President for Capital Markets, has been appointed interim CFO.

Cedar LNG is a 50-50 partnership between Pembina and the Haisla First Nation proposed for the Douglas Channel near the BC town of Kitimat and is expected have a liquefaction capacity of around 3 million tonnes per annum of LNG.

Feed gas for Cedar FLNG will be

sourced from the prolific Montney natural gas resource play in northeast BC.

Analysts said the change in CEO was unlikely to take the Cedar FLNG project off course as in its most recent earnings, the Calgary, Alberta-based company said the Cedar project was now formally part of its New Ventures division.

Pembina had also been the developer of the Jordan Cove export project in the northwest US state of Oregon before it was cancelled by US regulators.

Outgoing CEO Dilger said he was "immensely proud" of the Pembina team, the culture in the company and what had been accomplished.

"When I joined Pembina, it was a \$2.5 billion dollar entity in a single business and has grown into a roughly \$35Bln entity, operating safely, and successfully in multiple jurisdictions and in many businesses, with more underway," added Dilger.

Randall Findlay, Chairman of Pembina, said that during Dilger's tenure as CEO, Pembina accelerated its 65-year history of innovation and growth, becoming a leader in the midstream with a strong core business.

Pembina has formed a strategic partnership agreement with the Haisla First Nation to develop the Cedar FLNG venture to use abundant natural gas supply in BC and growing LNG infrastructure to produce "industryleading low-carbon, low-cost Canadian LNG" for overseas markets.

Pembina reported third-quarter earnings of C\$588 million (US\$472M) and adjusted gross earnings of C\$850 million, reflecting strong pricing across all commodities in Pembina's value chain.

Pembina and the leading Canadian pipeline company, TC Energy, also intend to jointly develop the Alberta Carbon Grid, a world-scale carbon transportation and sequestration system, which will enable Alberta-based industries to effectively manage their greenhouse-gas emissions.

PETRONET LNG, the largest Indian cargo importer, reported a surge in revenues and a decline in net profits as it planned a terminal expansion and the construction of a new facility on the East Coast.

The company's revenues in the Indian fiscal second quarter from July-to-September jumped 70 percent to 10,888.95 crore rupees (\$1.47 billion) compared with 6,377.66 crore rupees (\$860.91million) in the same three months of 2020. Petronet's net profits dropped 11.2 percent to 817.61 crore rupees (\$110.4M) from the 919.47 crore rupees (\$124.11M) reported in the same quarter of 2020.

Indian LNG imports have declined in the last few months to around 2 million tonnes per month or less, amounting to between 29 and 24 cargoes.

The company's main Dahej facility, sited north of Mumbai, has capacity to handle 17.5 million tonnes per annum and with six storage tanks and two more planned.

Most of India's shipments are handled at Dahej followed by Hazira and Dabhol and the rest are shared between the several other facilities.

Petronet 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.

Earnings per Petronet share dropped to 5.45 rupees compared with 6.13 rupees in the same three months of 2020, though were higher than the second quarter of 2021 level of 4.47 rupees.

Petronet also informed the Bombay stock exchange that the board had declared a special interim dividend of 7 rupees.

"The operations of the company were not materially interrupted during the lockdown due to the outbreak of Covid-19, as natural gas was declared as one of the essential commodities by the Government of India," Petronet noted in its statement.

Petronet's shares dropped by 0.89 percent to 233.50 rupees (\$3.15) per share after the earnings were released and ahead of a November 10 conference call with analysts.

The company awarded a contract in September 2021 for the engineering, procurement, construction and commissioning of two LNG storage tanks, each with a capacity of 170,000 cubic metres for Phase IIIB of the expansion of Dahej.

The contract went to L&T Hydrocarbon Engineering (LTHE) of India, a wholly owned subsidiary of global construction group Larsen & Toubro.

The project work was awarded through international competitive bidding on a lump-sum, turn-key basis.

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, Gas Authority of India, Indian Oil, Bharat Petroleum Corp. and Oil and Natural Gas Corp.

PILOT LNG, the developer of the Galveston LNG Bunker Port (GLBP) project in Texas, awarded the front-end engineering and design contract for marine infrastructure to W.F. Baird Associates.

"It was imperative that the company selected to carry out the FEED works for the Galveston LNG Bunker Port has an excellent track record of successfully executing marine terminal projects," said Pilot Chief Executive Jonathan Cook.

"Our selection of Baird is in recognition of their unparalleled expertise and commitment to engineering and designing safe, reliable and efficient projects and we are happy to continue to work with Baird as a preferred partner in GLBP," added Cook.

Pilot has already filed regulatory applications with the US Army Corps of Engineers (USACE) and other relevant regulatory agencies, possibly paving the way for a final investment decision in 2022.

According to the company, the main LNG storage facilities are expected to be located on Pelican Island in Galveston County in Texas.

As international regulators tighten emissions standards, the maritime industry is increasingly turning towards LNG as the marine fuel of choice due to its significantly lower emissions profile and cost competitiveness.

Analysts said the Galveston Bay area was an ideal location to add LNG bunkering infrastructure.

It has more than 10,500 deep-water vessel visits per annum and over 133,000 tug/tow movements on the Houston Ship Channel, as well as being the nation's fourth busiest cruise terminal.

"To further mitigate operational impacts, Pilot has chosen to utilize electric drives powered by electricity sourced 100 percent from Texas renewable energy, eliminating virtually all operating emissions related to the facility and likely making the GLBP project one of the greenest facilities of its type anywhere in the world," explained Pilot LNG.

Baird will provide a variety of services to Pilot LNG, including design of marine structures, metocean modelling including storm surge and tidal currents, dredging design and dredged material placement analysis.

Pilot LNG said that Baird's Houston

office would lead the assessment with support from the company's other North American and international offices.

"The GLBP project will provide one of the US's largest industrial port complexes, comprising the ports of Houston, Galveston, and Texas City, with the infrastructure needed to supply clean fuel to the growing global LNG bunker market," added Pilot LNG.

QATARENERGY placed the first batch of LNG shipbuilding orders with South Korean shipyards consisting of four vessels from Daewoo Shipbuilding & Marine Engineering (DSME) and two vessels from Samsung Heavy Industries (SHI), as part of QatarEnergy's shipbuilding program to serve future expansion plans.

The orders came in the form of QatarEnergy's declaration of its ship construction options with the two Korean shipyards under its "Reservation of Shipyard Capacity" agreements signed in May 2020.

The main South Korean shipbuilders won all the first big round of Qatari orders Between 2004 and 2007 for when Ras Laffan LNG plant came on stream.

"We are pleased to take this further step with DSME and SHI, which have built 23 Q-Flex and 14 Q-Max LNG vessels for Qatar as part of our previous LNG expansion projects," said Saad Sherida Al-Kaabi, QatarEnergy's President and CEO of QatarEnergy.

"These orders, and those that will follow in the near future, constitute a significant part of our program to expand Qatar's LNG fleet to meet the requirements of our LNG expansion projects, our existing fleet replacement as well as our LNG trading arm," explained Al-Kaabi.

"I would like to take this opportunity to thank the management and working teams from DSME, SHI, QatarEnergy and Qatargas, whose dedicated efforts were instrumental in the realization of this milestone," he added.

The North Field expansion projects will increase Qatar's LNG production capacity from 77 million tons per annum to 126 million tonnes per annum by 2027.

QatarEnergy's LNG carrier fleet programme is the largest of its kind in the LNG industry and could amount to 80 vessels in total to meet the shipping requirements of QatarEnergy's expansion as well as replacing part of Qatar's existing LNG fleet.

QatarEnergy has already ordered four

new LNG carriers from the Chinese Hudong-Zhonghua Shipbuilding Group of Shanghai.

The orders were made in October 2021 and were the first ever placed by the QatarEnergy or any of its affiliates with a Chinese shipyard for LNG carriers.

They were also the first in connection with an agreement to reserve ship construction capacity that was executed in April 2020 with Hudong-Zhonghua, which is a China State Shipbuilding Corp. (CSSC) subsidiary.

The Qataris had been expected at the time to centre most of their carrier building in South Korea but surprisingly chose China over the Koreans for the first tranche of berth reservations.

The value of this April 2020 agreement had the potential to be well in excess of \$3.0Bln and could lead to the building of at least 16 or up to 20 ships in China.

QATARENERGY is continuing to build the company's Chinese sales portfolio with yet another Sale and Purchase Agreement, this time with China's S&T International Natural Gas Trading Co. for the supply of 1 million tonnes per annum over a 15-year period starting in late 2022.

"This agreement marks further expansion of our customer base in the People's Republic of China, which can count on Qatar as a trusted and reliable energy partner," said Saad Sherida Al-Kaabi, the President and Chief Executive of QatarEnergy.

"We are pleased to welcome S&T into our family of long-term LNG customers and we are excited to work with them to help fulfil their long-term LNG requirements," added Al-Kaabi.

QatarEnergy said the LNG deliveries under the SPA would allow S&T to receive its volumes from Qatar's fleet of vessels, primarily at the Tangshan import terminal located in Caofeidian Port in northeast Hebei Province.

The Chinese volumes would be produced at the Qatar Liquified Gas Company (II) project at Ras Laffan.

QatarEnergy had disclosed on December 7 that it had signed an SPA with Guangdong Energy Group based in southern China for the supply of 1 MTPA of LNG over a 10-year period starting in 2024.

With the conclusion of the S&T deal and the Guangdong Energy agreement, China will be supplied with around 17.5 MPTA of LNG from Qatar under long-term SPAs.

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Deliveries under the Guangdong Energy SPA would be made to the Dapeng and Zhuhai receiving terminals on the Pearl River Delta.

Al-Saadi said that China was considered a major customer for the State of Qatar and a strategic partner in the energy sector.

Other supply deals with China have been previously arranged, though a landmark accord was reached in September 2021 when QatarEnergy signed an SPA with China National Offshore Oil Corp. for the supply 3.5 MTPA over a 15-year period starting in January 2022.

That SPA was signed during a virtual ceremony involving Al-Kaabi and Wang Dongjin, the Chairman of CNOOC.

QatarEnergy signed a previous deal in July 2021 in the form of 10-year SPA with Shell for the supply of 1 MTPA of LNG to China.

RELIANCE Industries, the Indian group behind the resurgence of the country's domestic natural gas production in competition to LNG, has sold its stake in the US Eagle Ford Shale play in south Texas to a Delaware-registered company.

The Indian company said the US unit, Reliance Eagleford Upstream Holding, signed agreements with Ensign Operating LLC to "divest its interest in certain upstream assets" in the Eagle Ford Shale

"With this transaction, Reliance has divested all its shale-gas assets and has exited from the shale-gas business in North America," stated Reliance.

The sale followed Reliance's off-loading of its Marcellus Shale assets in southwest Pennsylvania in February 2021 to Northern Oil and Gas Inc., also a Delaware corporation, for \$250 million. The value of the Eagle Ford transaction was not disclosed.

Reliance is India's largest private sector company with annual turnover of \$78 billion.

The company said its sales deal was signed with Ensign on November 5 for the Eagle Ford holdings.

The previous Asian company to withdraw from US shale was Japanese trading house Sumitomo Corp.

The company sold its shale oil business in the US, which was partly in the Eagle Ford Shale, during the fourth quarter of 2020.

Reliance is the leading Indian natural gas producer in the ultra-deep-water blocks in the Krishna Godavari Basin offshore the East Coast and supplying a large proportion of the nation's domestic gas needs.

Reliance and partner, UK major BP, have brought on stream two out of three development blocks in the KG D6, the principal Indian gas basin.

The onstream fields are called R Cluster and the Satellite Cluster and the third, which is still to start up, is called the MJ field. Together they can produce around 30 million standard cubic metres per day.

The fields in the project are able to utilise the existing hub infrastructure in KG D6 block, in which Reliance is the operator with a 66.67 percent stake and BP holds 33.33 percent.

The MJ field is expected to come onstream towards the latter half of 2022 to further boost output.

India's LNG imports of more than 320 cargoes a year are currently on a par with its domestic natural gas output.

The three new KG D6 fields. along with LNG imports, are supporting the country's policy to improve clean energy resource availability in the future mix.

SAUDI ARABIAN Oil Company (Aramco) has signed a \$15.5 billion lease and leaseback deal involving its natural gas pipeline network with a consortium led by a unit of the US investment management firm BlackRock.

The leaseback deal was signed by BlackRock Real Assets and Hassana Investment Co., the investment management arm of the General Organization for Social Insurance (GOSI) in Saudi Arabia.

The transaction was described as "one of the world's largest energy infrastructure deals" to be concluded.

"This represents significant progress in Aramco's asset optimization program and is the second such infrastructure transaction by Aramco this year after the closing of the oil pipeline infrastructure deal in June 2021," added Aramco.

Aramco's oil pipeline infrastructure deal involved a consortium led by EIG Global Energy Partners and was a \$12.4Bln lease and leaseback transaction.

The Saudi company said that upon completion of the natural gas pipeline transaction, Aramco will receive upfront proceeds of \$15.5Bln, further strengthening its balance sheet.

"The deal unlocks additional value from Aramco's diverse asset base and has attracted interest from a wide range of worldwide investors, highlighting the compelling investment opportunity," explained Aramco.

As part of the transaction, a newlyformed subsidiary, Aramco Gas Pipelines Company, will lease usage rights in Aramco's gas pipelines network and lease them back to Aramco for a 20-year period.

In return, Aramco Gas Pipelines Co. will receive a tariff payable by Aramco for the gas products that will flow through the network, backed by minimum commitments on throughput.

Aramco will hold a 51 percent majority stake in Aramco Gas Pipeline Co. and sell a 49 percent stake to the investors led by BlackRock and Hassana.

Aramco emphasized that it would continue to retain full ownership and operational control of its gas pipeline network and the transaction would not impose any restrictions on Aramco's production volumes.

"With gas expected to play a key role in the global transition to a more sustainable energy future, our partners will benefit from a deal tied to a worldclass gas infrastructure asset," said Amin H. Nasser, Aramco President and Chief Executive.

BlackRock Chairman and CEO Larry Fink said the New York-based fund was pleased to work with Aramco and Hassana on the landmark transaction for Saudi Arabia's infrastructure.

"Aramco and Saudi Arabia are taking meaningful, forward-looking steps to transition the Saudi economy. Responsibly-managed natural gas infrastructure has a meaningful role to play in this transition," added Fink.

SEMBCORP MARINE of Singapore said it signed a contract with US engineering company Bechtel for module assembly of the second liquefaction Train proposed for Woodside's Pluto LNG export project in Western Australia.

Sembcorp's wholly-owned subsidiary, Sembcorp Marine Offshore Platforms Ltd, signed the agreement with the Bechtel unit Bechtel Overseas Corp.

"Bechtel and Sembcorp Marine Offshore Platforms will form an integrated management team to manage the module assembly programme for Pluto Train 2, scheduled to be completed in 2024," said the Singaporean company.

Pluto LNG is currently a single-Train plant on the Burrup Peninsula near Karratha in the northwest of Western Australia and currently processes gas from the Pluto and Xena offshore fields. Woodside has operated Pluto LNG since its start-up in 2012 and the additional Train will also process gas from the Scarborough gas field.

The construction of second Pluto Train will expand the plants processing capacity by around 5 million tonnes per annum and allow for the access of thirdparty gas resources.

"Sembcorp Marine is pleased to collaborate once again with Bechtel on an Australian LNG project," said Samuel Wong, the Sembcorp Marine Head of Offshore Platforms.

"The Group looks forward to executing the project safely and efficiently and we thank Bechtel for their continued trust in our capabilities," added Wong.

Sembcorp Marine said previous collaborations between the Singapore company and Bechtel included the Australia-Pacific LNG project in Queensland of ConocoPhillips and the Wheatstone project of Chevron Corp. in Western Australia.

While Bechtel is leading the build-out of US LNG export plants on the Gulf Coast, the company has also been at the forefront of Australian LNG.

Bechtel was the engineering, procurement and construction contractor for all three coal-seam-gas-to-LNG plants built on Curtis Island near the port of Gladstone

The three projects, APLNG, Queensland Curtis LNG and Gladstone LNG, are located side-by-side.

Each project optimized the extent of modularization through construction-led engineering and employed a unique execution approach in collaboration with fabrication yards.

Together, the three Curtis Island plants, when completed accounted for over 25 MTPA of LNG capacity, roughly 8 percent of global production at the time, with QCLNG first on stream in December 2014.

SEMPRA Infrastructure, a new subsidiary of Californian utility Sempra Energy, said it was planning a second liquefied natural gas export plant on the Pacific Coast of Mexico.

Sempra stated in a conference call on its third-quarter earnings that the new Mexican project is called the Vista Pacifico LNG export venture and would be in addition to the Energía Costa Azul LNG export project transforming the existing import terminal into an export plant.

Sempra stated that the Vista Pacifico

LNG project and the expansion of Sempra's Cameron LNG export plant in Louisiana would take priority over the company's planned Port Arthur LNG project in Texas.

"Vista Pacifico LNG is a new development project located adjacent to the Topolobampo refined products terminal," explained Sempra Infrastructure Chief Executive Justin Bird.

"This new project is expected to be a mid-scale facility connected to two existing pipelines, one of them being the high-pressure pipeline system we own in Sonora," said Bird.

"The project would source lower cost natural gas from the Permian Basin for export to high demand Asian markets," stated the Sempra unit CEO.

Sempra's emergence of the Vista Pacifico project means there are now three US-backed LNG export ventures progressing on the Pacific Coast of Mexico.

In the addition to Costa Azul and Vista Pacifico, there is also the US Mexico-Pacific Ltd (MPL) LNG project.

The MPL company is based in Houston and has joined with LNG engineering firm Bechtel Inc. on developing a Mexican liquefaction and export facility on the Pacific Coast using US natural gas as the feed gas and processing technology from ConocoPhillips.

The Mexican LNG export plant is proposed for near Puerto Libertad in the northwest state of Sonora and would have just over 14 million tonnes per annum of output.

Sempra Infrastructure and the LNG plants have a shareholder the US investment fund Kohlberg Kravis Roberts, now known as just KKR.

Sempra agreed in April 2021 to sell a non-controlling 20 percent interest in Sempra Infrastructure Partners KKR for \$3.37 billion in cash.

That transaction valued Sempra Infrastructure Partners at round \$25.2Bln, including expected assetrelated debt of \$8.37Bln.

"I'm excited to present the newly formed Sempra Infrastructure platform," Sempra Infrastructure CEO Bird told the conference call.

"We expect the formation of Sempra Infrastructure along with the financial strength of KKR to give us added scale to execute on a wide range of energy infrastructure opportunities across Sempra Infrastructure's three business lines," explained Bird. "Since closing this transaction a month ago, we're already seeing the benefits of combining the two organizations through financial synergies and commercial optimization," he added.

"To capture new development opportunities, we've organized into three business lines: LNG and Net Zero Solutions, Energy Networks, and Clean Power," stated Bird.

"This strategically positions us to benefit from North America's continued trend toward the clean energy transition by optimizing the natural partnership between natural gas and renewables to help meet decarbonization goals here in North America and abroad," declared Bird.

Bird stated that the LNG market had recovered quite dramatically as evidenced by the spot market with record high prices being seen in Europe and Asia .

"With that constructive backdrop, our LNG development portfolio is expected to benefit from the strategic advantage of being situated on both the Pacific and Gulf Coast with direct access to both Asian and European markets," said Bird.

Sempra said that at Cameron LNG, the current facility is running well and hit record production levels during the month of October.

"Together with our partners, we are developing a projected 7 million tonnes per annum expansion project benefiting from 1 million tonnes per annum of debottlenecking Trains 1-3," explained Bird.

"With innovations in Train design coupled with the high performance of Trains one through three, we expect this to be a very competitive, capital efficient expansion," he added.

"In terms of next steps, we plan to move to feed early next year to file an amendment with FERC to build Train 4 with electric drives in order to reduce Scope 1 emissions and to work closely with our partners as we advance toward FID," stated Bird.

SENEX ENERGY, the Australian coal-seam gas company in Queensland with an stake in Gladstone LNG, has entered into a binding with agreement with South Korea's POSCO International for a cash offer price of A\$4.60 per share.

The current offer to Senex's amounts to A\$848 million (US\$605.7M), an improvement on the previous A\$815M offer, or A\$4.40 per share, from POSCO, the South Korea industrial and steel company seeking to secure LNG imports. The Senex assets are centred on the onshore Surat Basin, one of the main CSG resources that supply Queensland's LNG export plants and domestic gas markets.

Senex supplies the Gladstone facility on Curtis Island, close to the other two plants, the Shell-operated Queensland Curtis LNG and the ConocoPhillips-run Australia-Pacific LNG.

POSCO International, which is listed on the Korean Stock Exchange, has seen its latest offer recommended to Senex shareholders.

The offer from POSCO International, the trading arm of the South Korean steel-making company, has already been improved several times after initial approaches in mid-2021.

A POSCO statement said the company was pursuing an acquisition of Senex as part of its efforts to secure natural gas reserves for energy security.

Senex is looking to more than triple its annual output to 9.8 million barrels of oil equivalent (1.6 billion cubic metres of natural gas) by June 2025, which will help it meet a 15-year agreement to supply the Gladstone LNG plant, operated by Australian energy company Santos.

Among the other shareholders in Gladstone LNG is Korea Gas Corp., South Korea's state energy company and operator of four LNG import terminals.

Senex, based in Brisbane in Queensland, has been a rapidly growing gas producer supplying Australia's East Coast market, where prices have more than doubled over the past six years following the start of the three LNG export plants.

"The Senex Board unanimously recommends that shareholders vote in favour of the scheme, in the absence of a superior proposal and the 'Independent Expert' concluding (and continuing to conclude) that the scheme is fair and reasonable and therefore in the best interests of shareholders," said the latest Senex statement from Chairman Trevor Bourne.

The cash offer price represents a 34 percent premium to the trading day price prior to the first public announcement of takeover discussions.

In addition, Senex said it intended to pay a dividend of up to A\$0.05 per share for the half year ending 31 December 2021.

"The offer, which is recommended by the Board, reflects an attractive value for Senex and the opportunity for our shareholders to realise a certain cash price for their shares," stated the Chairman.

"The POSCO offer is conditional upon a Senex shareholder approval, Court approval, Australian Foreign Investment Review Board approval and completion of the proposed acquisition of natural gas fields PL 209 and PL 445 and other customary conditions for a transaction of this nature," the statement concluded.

Senex expects the transaction to be completed in late March 2022.

Senex appointed Macquarie Capital and Rothschild & Co as financial advisors and Clayton Utz as legal advisor.

SNAM, the Italian LNG terminal and gas grid operator, has acquired a stake in the Egypt-Israel natural gas pipeline from Arish to Ashkelon and the transaction marks the entrance of Snam into the Eastern Mediterranean market where gas demand growth is forecast.

Snam bought the 25 percent stake in the East Mediterranean Gas Company (EMG), the so-called "Peace Gas Pipeline", for \$50 million from Thailand's energy company, PTT Energy Resources.

The Arish-Ashkelon pipeline is an undersea line of 90 kilometres (56 miles) in length connecting the Israeli terminal of Ashkelon to the Egyptian receiving station of Al-Arish.

The pipeline has a daily maximum capacity of around 12 million cubic metres and the volume is expected to be expanded.

Built in 2008 to transport Egyptian gas to Israel, at the beginning of 2020 it turned into one of the main energy supply sources for Egypt, receiving gas from the Israeli Leviathan and Tamar offshore natural gas fields.

With a 39 percent stake, EMED is the main shareholder of EMG and Israel's Delek Drilling as well as US major Chevron Corp., the operator of the Leviathan and Tamar gas fields, also have equity investments in the company.

"The Arish-Ashkelon gas pipeline supplies a market characterised by an annual increase in natural gas demand of 8 percent due to the growth in consumption," said Snam,

Snam, whose name comes from Societa Nazionale Metanodotti (National Pipeline Company), operates the Italian gas grid and the onshore Panigaglia facility in the northwest near Genoa as well as having a 49 percent stake in the LNG facility, the "FSRU Toscana", located off the West Coast of Italy.

The latest Snam deal follows Snam's

recent acquisition of Italian energy company Eni's minority stake in two pipelines involved in transporting natural gas from Algeria to Italy for €385 million (\$435M).

Snam purchased a 49.9 percent stake in the onshore gas pipelines running from Algeria to the Tunisia border and the Tunisia coast (TTPC), and the offshore gas pipelines connecting the Tunisian coast to Italy (TMPC).

The overall Algeria-Italian gas link is called the Trans-Mediterranean Pipeline via Tunisia to Sicily and then onwards to the Italian mainland.

Algeria last year exported to Italy a volume of gas of 14.8 billion cubic metres, an increase of 12 percent compared with the previous year.

That transaction came just after Algeria's shutdown at the end of October 2021 of the Maghreb-Europe Gas Pipeline from the Hassi R'mel gas field through Morocco to Cordoba in Spain, one of two pipeline from Algeria to Spain.

Snam is additionally one of the shareholders in Greek gas network owner DESFA along with Spain's Enagás and Belgium's Fluxys. The three companies hold a combined 66 percent in DESFA while the Greek state owns 34 percent.

The three also have a stake in Trans-Adriatic Pipeline bringing Caspian natural gas from Azerbaijan via Greece and Albania and under the Adriatic Sea to Italy.

SWISS LNG-equipment firm Burckhardt Compression has strengthened its service business in the maritime and petrochemical industry with expansion into the LNG port of Rotterdam in the Netherlands.

Burckhardt said it signed an agreement to acquire 100 percent of the shares in Mark van Schaick BV.

"The company has more than 20 years of experience in machining and is a leader in servicing complex repairs such as crankshafts," explained Winterthur-based Burckhardt.

Burckhardt said that last year the Mark van Schaick company recorded sales of about 9 million Swiss francs (\$9.8M) with 27 employees.

"With the acquisition of Mark van Schaick BV, Burckhardt specifically complements its repair and service capabilities in Europe and further expands its presence in the service business for reciprocating compressors," stated the company.

"Burckhardt hereby also gains highly

specialized machining expertise and repair capabilities for the global customer base in the maritime and petrochemical industry," it added.

"In line with our strategic ambitions, we strengthen our repair and machining capabilities with highly specialized knowhow to serve our customers as full-service provider," declared Marcel Pawlicek, Chief Executive of Burckhardt.

Burckhardt added that both parties had agreed not to disclose the purchase price. Closing is expected within the next few weeks.

Burckhardt itself reported a rise in fiscal first-half operating income as sales surged and earnings per share jumped.

Burckhardt reported "significantly higher' order intake of 450.7 million Swiss francs (\$493.5M), up 48.7 percent from 303M francs (\$332M) in the year-ago period.

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 fuelgas 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, Burckhardt has expanded in recent years to run businesses in the US, Japan and China.

Burckhardt gave a qualified outlook for fiscal 2021 as a whole and currently expects group sales of between 620M Swiss francs to 650M Swiss francs and higher profit margins.

This assumed that there would be no further serious outbreaks of Covid-19 in markets relevant to Burckhardt and that the global economy continued to recover.

TRAFIGURA, the global commodities firm, said in its fiscal 2021 report that revenues, earnings and liquefied natural gas volumes increased amid rising prices, partly because of stronger LNG demand from Asia due to low hydropower reserves this year in China and also lower coal production.

Trafigura said LNG spot cargo values, the Japan-Korea Marker price, reached a record level of \$35 per million British thermal units as the region attracted increasing numbers of shipments despite production disruptions in Russia, Australia, Nigeria and Norway.

"European inventories were also at extremely low levels coming out of summer 2021," said Trafigura.

"This points to the potential for further

disruptions if the continent sees another cold winter and Europe is not the only area that has had to deal with powerrelated curtailments with China enacting production cuts, primarily in the energyintensive steel and aluminium sectors," explained the firm.

Trafigura's LNG volumes rose about 10 percent in the fiscal year to the end of September as the firm continued to expand the business and volumes increased to 14 million tonnes compared with 12.7MT in the prior-year period.

Trafigura said its integrated LNG and natural gas team had "performed well, weathering the multitude of storms the gas market experienced" during the year.

Trafigura posted 57 percent higher fiscal 2021 revenues of \$231.3 billion for all commodities sectors, reflecting higher commodity prices and increased trading volumes.

Underlying gross earnings rose 13 percent to \$6.86Bln from \$6.07Bln in 2020.

Net profits amounted to \$3.07Bln, almost double the prior year's result, despite including a one-off, non cash accounting adjustment which reduced net profit by \$716M due to international accounting rules on the treatment of a foreign currency reserve following the consolidation of Puma Energy into the Trafigura Group.

"In these extremely volatile times, simplicity of supply chains remains our guiding principle," Trafigura said.

Looking forward, Trafigura said its goal over the next 12 months is to work with the company's customers to "create solutions that protect them as much as possible against such price fluctuations" in the future.

The firm noted that recent events have illustrated that natural gas is vitally needed to fuel baseload power supply alongside renewable power and, in some applications, as a transition fuel.

"Trafigura's performance in 2021 again set new records in terms of volumes handled and overall profitability," said Jeremy Weir, Trafigura's Executive Chairman and Chief Executive.

"We also made excellent progress over the course of the year in further diversifying our business to play a meaningful role in the ongoing energy transition," added Weir.

Trafigura believes that LNG supply would have been tight in any case as plants were subject to maintenance that had been delayed by Covid-19 and a number of facilities experienced greater than usual reliability issues.

"Europe and the Far East outcompeted each other to attract US LNG, pushing the price up as low inventories in Asia and Europe caused market concern," said Trafigura.

"We complemented our existing natural gas trading operations in Europe, Mexico and the US by acquiring licences to trade gas in other liberalising domestic markets," it added.

VENTURE GLOBAL, the US LNG

export plant developer, is now in the process of investing in and constructing four liquefaction and export plants in Louisiana with 70 million tonnes per annum of output as the latest facility applied for regulatory permits.

The most advanced plant in terms of construction, the Calcasieu Pass facility in Cameron Parish in Louisiana, south of the city of Lake Charles, is scheduled to start commercial production in 2022 with exports 10 MTPA of LNG on completion.

Venture Global's fourth LNG export plant, after Plaquemines LNG and Delta LNG, is called the CP2 LNG project and would be built on a 540-acre site in Cameron Parish, adjacent to the Calcasieu Pass facility.

These three plants will each have a combined 60 MTPA of nameplate capacity versus 10 MPTA at Calcasieu Pass.

The Plaquemines and Delta facilities will be built near river mile-marker 55 on the banks of the Mississippi River, about 30 miles south of New Orleans.

The Arlington, Virginia-based company has just submitted a formal application requesting authorization from the Federal Energy Regulatory Commission to site, construct and operate the CP2 LNG facility and the CP Express pipeline.

CP2 LNG comprises of a facility with nameplate liquification of 20 MTPA and the CP Express will provide feed gas sourced from resource rich North American onshore natural gas basins.

Venture Global will be the state's largest LNG exporter and when the four plants are completed, Louisiana with have seven industrial-scale facilities, including Cheniere Energy's Sabine Pass plant, the Cameron plant operated by California-based Sempra Energy and the Driftwood facility being developed by Charif Souki's Tellurian Inc.

The seven Louisiana plants are expected to have up to 144 MTPA of output, including current expansion plans, which would be well ahead of the Middle East state of Qatar, and will make

the US Gulf Coast state the World's No. I LNG exporter.

Venture Global and the Governor of Louisiana, John Bel Edwards, jointly announced the latest CP2 LNG project comprising an investment of \$10Bln and the creation of more jobs.

"Venture Global has invested significantly in Louisiana's economy, and I am proud to celebrate this exciting new project with them," said the Governor.

"The CP2 facility in Cameron will create more than 1,000 new permanent jobs and thousands of construction jobs in the area, which will have a significant impact on our economy," he explained.

"The direct new jobs created by the project will have average annual salaries of \$120,000 plus benefits," said the joint statement.

Venture Global Chief Executive Michael Sabel said the company was proud to continue its expansion in Louisiana with the launch of its next project, CP2 LNG.

"CP2 will be located in Cameron Parish, adjacent to our existing Calcasieu Pass terminal and these two projects, combined with our Plaquemines LNG facility now under construction, represent more than \$20Bln of investment in the State of Louisiana," explained Sabel.

"With two major LNG export projects currently under active construction, Venture Global is on a mission to produce the cleanest, low-cost LNG in North America," stated Sabel.

"We are proud to partner with Louisiana in these efforts and in developing Carbon Capture and Sequestration (CCS) for our facilities," added the CEO.

"Under the leadership of Governor John Bel Edwards, Louisiana is enhancing its status as an international hub for innovation to tackle the energy and climate challenges of our time," he said.

Diary of events

2022

Canada Gas & LNG Exhibition & Conference

10-12 May 2022 JW Marriott Parq Vancouver 39 British Columbia, Canada https://www.canadagaslng.com

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 Venture Global in November 2021 signed supply deals with the Chinese major, China Petroleum and Chemical Corp., also known as Sinopec.

The two 20-year Sales and Purchase Agreements (SPA) are for a total of 4 MTPA from the Plaquemines LNG facility.

In addition, a Sinopec subsidiary Unipec, has agreed to purchase 3.5 MTPA for a shorter duration from Calcasieu Pass when it comes on stream.

The other three Louisiana projects, particularly Cheniere's Sabine Pass, will also be major LNG suppliers to China for the next 20 years or more.

WOODSIDE, the operator of two liquefied natural gas export plants in Western Australia, has signed an accord which could enable Woodside to supply LNG to the East Coast market through Viva Energy's proposed regasification terminal at Geelong in the southern state of Victoria.

Woodside and Viva Energy, the refinery operator and leading supplier of Shell fuels in Australia, have entered into a memorandum of understanding to progress discussions on capacity rights at the LNG terminal at the site of Viva Energy's Geelong oil refinery.

"Under the terms of the MoU, Woodside will discuss with Viva Energy the opportunity to acquire regasification capacity usage rights at the terminal to regasify LNG," said a statement.

"This could help underpin the Gas Terminal Project as a key infrastructure solution to address the expected gas supply shortfall in the East Coast Australian market from the mid-2020s, and support the National Electricity Market's transition to lower-carbon energy," the companies added.

In addition, Viva Energy said it signed a Heads of Agreement with Höegh LNG to charter a floating storage and regasification unit (FSRU) for the proposed Geelong Gas Terminal.

Melbourne-based Viva Energy said Höegh LNG was an industry leader in FSRU import solutions and currently operates a fleet of 10 FSRUs and two LNG carriers.

"The HoA sets out a framework and key terms for the negotiation of a binding Time Charter Party (TCP) agreement and is a material step in the delivery of the Viva Energy Gas Terminal project, confirming an FSRU provider for the project," added Viva Energy.

Viva Energy's existing LNG

regasification terminal partners are Engie Australia & New Zealand, Mitsui & Co. of Japan and global commodities firm Vitol.

The Woodside-Viva Energy accord outlines terms for ongoing discussions of a capacity rights agreement at the LNG terminal, which subject to definitive agreements and approvals, would enable Woodside to supply LNG and to regasify it at Geelong.

"The MoU provides a framework and timeline to negotiate binding regasification capacity commitments, which are targeted to be executed following Woodside and Viva Energy approvals and are subject to a final investment decision," said the companies.

Woodside will work together with Viva Energy in the project on an exclusive basis in relation to LNG regasification terminals in southeast Australia.

Subject to regulatory approvals, Viva Energy is planning to take a final investment decision to proceed with the project by the third quarter of 2022.

Woodside Chief Executive Meg O'Neill welcomed the collaboration with Viva Energy on potential LNG supply from Woodside's portfolio of the North West Shelf and Pluto liquefaction and export plants supplying Asia with cargoes.

"Our MoU with Viva Energy presents an opportunity for Woodside to supply reliable, cost-competitive LNG from our Western Australian projects and global portfolio into the East Coast gas market, which is predicted to face a shortfall in coming years," added O'Neill.

"Working to secure regasification capacity at Viva Energy's proposed import terminal aligns with Woodside's future production profile and the ongoing needs of East Coast Australian customers for reliable, lower-carbon energy sources," she added.

Viva Energy CEO Scott Wyatt said he was very pleased to be making progress in the talks with Woodside.

"Woodside's experience and capability in LNG supply, shipping, terminals and international gas markets will assist us in progressing the Gas Terminal Project," stated Wyatt.

"Woodside's potential participation in the Gas Terminal Project highlights the value of LNG terminals as 'virtual pipelines' to deliver LNG from Australia and other sources into the East Coast domestic gas market," he explained.

"This can be achieved more efficiently than building new pipelines to transport gas from other domestic gas sources to the southeast Australian gas market," added Wyatt.

ZVEZDA Shipbuilding in the Russian Far East has started steel-cutting for its latest Arc7 ice-class LNG carrier to serve the increasing Arctic LNG production plans being developed by natural gas company Novatek.

"The construction of the vessel, the fifth in a series of 15 LNG carriers ordered from the shipyard within the framework of the 'Arctic LNG-2' production project implementation, started with the ceremony of the first steel-cutting," said Zvezda in a statement.

"The main project sponsor and charterer of the vessel is the Novatek company," the shipyard added.

The shipbuilding process at the yard in Bolshoi Kamen on the coast of the Sea of Japan, about 12 miles northeast of Vladivostok, is being supervised by the Russian Maritime Register of Shipping and French class society Bureau Veritas.

Zvezda is the first Russian shipyard implementing a project for the construction of such LNG vessels.

"A distinctive feature of LNG carriers is the availability of the Mark III membrane-type LNG storage system," said Zvezda.

"The licence for construction was obtained by the shipyard for the first time in the country, having successfully passed the audit of Gaztransport & Technigaz, the French engineering company specializing in the development and licensing of the construction of cryogenic membrane containment systems dedicated to the transport and storage of LNG," explained the shipyard.

Ice-class LNG carriers are designed to operate in Arctic conditions and due to the Arc7 strengthened hull have ice-breaking capability in up to 2.1 metres-thick ice.

All 15 vessels are scheduled for delivery in 2023-2025. The keels of the vessels are being laid in line with the contractual schedule.

The Arc7 vessels are ultimately designed for the year-round transportation of LNG in the challenging conditions along the Northern Sea Route from near the Russian port of Murmansk to the Bering Strait and into North Asia.

Each LNG carrier will be 300 metres long, 48.8 metres wide and will have a cargo capacity of 172,600 cubic metres.

The propulsion system includes three azimuth propulsion units and with a total power capacity of 45 megawatts.

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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 railExpansions of LNG reception terminals are only shown if
- they involve new storage tanksWhere 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

_			_	St	orage
Country	Location (Project)	Owners	Start up	Tanks	Capacity
Belgium	Zeebrugge	Fluxve	1087	Λ	380.000
Capada	Zeeblugge	Fluxys	1907	4	
Canada		Irving Oil, Repsol	2009	3	480,000
Chile		ENAP, Metrogas, Enagas	2009	3	334,000
China	Nejliones	Engle, Ameris Capital AGF	2010	1	175,000
China	Beinai Ling, Guangxi	Sinopec	2015	4	640,000
	Dallan	PetroChina	2011	3	480,000
	Dapeng ND Guangdong		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, Zheijang	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
Tranco	Montoir-de-Bretagne	Elengy	1980	3	360,000
		Engle Total	2010	3	330,000
	Dunkirk I NG	EDE Eluxue Total	2010	3	570,000
Cibraltar		Shall	2010	1	570,000
	Bayithauaaa		2010	۱ ۲	3,000
	Revillioussa	OALL NITRO (Detregini Cos & Devier)	2000	<u> </u>	225,000
India		GAIL, NTPC (Ratnagin Gas & Power)	2009	3	480,000
	Darlej	Chall India Tatal	2004	4	592,000
	Hazira		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
	Himeii 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 I NG	1977	8	480 000
	Fukuoka	Saibu Gas	1003	2	70 000
	Sodeshi	Shizuoka Gas	1006	2	337 200
	Hateukaichi	Hiroshima Gas	1006		170.000
	Kanoshima	Ninnon Gas	1006	2	136.000
	Shin Minata	Sondai City Cas	1007	<u>۲</u>	80,000
			1997	<u>ا</u>	00,000
		Jaibu Gas	2003	1	30,000
			2006	3	420,000
	wizusnima	Nippon OII, Unugoku Electric	2006	2	320,000

LNG Import Terminals (continued)

				St	orage
Country	Location (Project)	Owners	Start up	Tanks	Capacity
	Sakaida	Shikaku Elastria, Casma Oil	2011	1	190.000
lonon (continued)		Hekkeide Cee, Hekkeide Electric	2011	۱ ۵	280,000
Japan (continued)			2012	2	380,000
	Okinawa		2012	2	260,000
			2013	2	360,000
		JERA Co. Inc.	2011	3	540,000
	Hachinone LNG		2015		280,000
		lokyo Gas	2015	1	230,000
			2017	1	225,000
Korea	Boryyeong	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	Sempra 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
Phillipines	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, Giión.	Enagas	2013	2	300.000
Sweden	Lvsekil	Gasum	2014	1	30.000
	Nynashamn	AGA Gas	2011	1	20.000
Taiwan	Yung-An	CPC	1990	6	690,000
landi	Tai-Chung	CPC	2009	5	800,000
Thailand	Map Ta Phut	PTTING	2011	2	320,000
Turkey	Marmara Fredisi	Botas	1994	3	255,000
rantoy	Izmir	EgeGaz	2006	2	280,000
	Everett	Suez ING NA	1971	2	155,000
00/1		Shell ETE	1982	1	425,000
	Ereenort	Ereeport LNG Development	2008	2	320,000
			2000	 	775 000
			2010	<u> </u>	220,000
	- ascayoula, IVIS		2012	2	1 000 000
UN		EvvonMobil Octor Detroloure Total	2005	0 E	775.000
			2009	0	210,000
	Dragon LING, MILITOR Haven	Shell, Petronas	2009	2	310,000

LNG Import Terminal Projects

Country	Location/Project	Owners/Project Developers	Start up	Sto	orage
				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, Pertimana	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, PGP 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 Goldboro LNG, Nova Scotia Kitimat LNG, BC LNG Canada, BC Kwispaa FLNG, Vancouver Vancouver Tilbury Woodfibre LNG, Squamish	LNG Ltd. Pieridae Energy Woodside, Chevron Shell, Mitsubishi, Kogas, PetroChina, Petronas Steelhead LNG WesPac Midstream Pacific Oil & Gas Co	2024 2024 2024 2024 2024 2024 2021 2020	4 2 2 4 1 2	8.0 10.0 10.0 12.0 12.0 3.25 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 Area 4 Onshore Area 4 FLNG	Anadarko Petroleum and partners Eni and partners Eni and partners	2023+ 2023+ 2022	2 2 1	10.0 10.0 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 Vladisvostok LNG Arctic LNG II Siberia	Gazprom, Shell, Mitsui, Mitsubishi Gazprom, Itochu, various Novatek, Total	2021 2023+ 2023	studies 2 3	10.0 19.8
USA	Alaska LNG Nikiski Annova LNG, Brownsville Commonwealth LNG, Louisiana Delfin LNG, Louisiana Driftwood LNG, Louisiana Galveston Bay LNG Golden Pass, Texas Jacksonville, St John's River Jordan Cove, Coos Bay Lake Charles, Louisiana Magnolia LNG Port Arthur LNG Rio Grande LNG Sabine Pass LNG, Louisiana Texas LNG Brownsville VG LNG (Cameron Parish) VG LNG (Plaquemines)	Alaska Gasline Development Corp. Exelon Corp. Commonwealth LNG LLP Delfin Tellurian, Total and others NextDecade Qatar Petroleum, ExxonMobil Eagle LNG, Ferus Natural Gas Fuels Pembina Corp. Shell, ETE Louisiana LNG Ltd. Sempra NextDecade Cheniere Chandra, Meyer, Samsung, others Venture Global Venture Global	2023+ 2023+ 2023+ 2023+ 2023 2023+ 2024 2024 2024 2024 2023+ 2023+ 2023+ 2023+ 2016-19 2023+ 2022 2022 2022	3 6 8 3 6 6 3 small 2 3 4 2 6 1 2 5 10 36	20.0 6.0 9.0 27.6 27.0 15.6 TBC 7.8 15.0 8.0 10.0 27.0 4.5 4.0 12.0 20.0 22.5

LNG Exporters

Country	Location/Project	Shareholders	Start up	Li	quefaction	St	torage
				Trains	capacity (nominal) mtpa	No. of tanks	Total capacity m ³
ABU DHABI (UAE)	Das Island (Adgas)	ADNOC, Mitsui, BP, Total	1977 1994	2	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	<u> </u>	270.000
	Karratha	NWS Woodside Shell BHP	1080	2	5.0	<u> </u>	260,000
AUGHIALIA	Karratha	(BP Chevron	1992	1	2.5	1	130,000
		(Mistubishi/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
	VVneatstone LNG	Chevron, Woodside, Kuwait (KUFPEC), Jera, Kyushu	2017	2	8.9	2	300,000
	Proludo ELNG	Shell Innov Korac CPC	2010	2	0.9	Z	330,000
BRUNEI		Brunei/Shell/Mitsubishi/Total	1072_7/	5	7.2	3	176.000
	Hilli Episevo ELNG	Kribi Perenco	2018	1	1.2	1	125 000
EGYPT	Damietta	Union Fenosa, EGPC, EGAS	2004	1	5.0	2	300.000
	ldku	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		170.000
	Sulawesi LNG	Medco Energi, Pertamina, Mitsubishi	2015	1	2.0	1	170,000
	Riptulu (MLNG Satu)	BP, MI Berau, CNOOC, Nippoli, LNG Japan	2000	2	7.0	<u> </u>	260,000
IVIALA I SIA	Bintulu (MLNG Dua)	Petronas, Salawak, Milsubishi Petronas, Shell, Sarawak, Mitsubishi	1905	3	7.8	4	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	•	120,000
	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	Mitsubishi, Mitsui, Partex and Itochu	2000	2	7.1	2	240,000
	PNGING	ExxonMobil Oil Search Santos JX Ninnon Oil	2000	2	69	2	320.000
	Peru I NG	Hunt Oil Shell Marubeni SK Group	2014	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-TI	QP, Shell	2010	1	7.8		
	RasGas I- T1&2	QP, ExxonMobil, Kogas, Itochu, LNG Japan	1999	2	6.6		
	RasGas II- 13	QP, EXXONMODII	2004	1	4./	~	0.40,000
		QF, EXXONIVIODII OR ExxonMobil	2005		4.1	6	840,000
	RasGas II- 15 Rasgas III T6		2007	1	4.7		
	Rasgas III – T7	QP. ExxonMobil	2003	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	Point Fortin Train 1	BP, Shell, CIC, NGC	1999	1	3.0	2	204,000
& TOBAGO	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	I exas Cheniere	2018	3	15.0	3	480,000
	Cameron Hackberry	Sempra, Lotal, Mitsul, Mitsubishi	2019	10	9.8	3	480,000
	Freeport I NG Toyoo	Freeport I NG	2019	2	2.0 10.2	2	183 000
YEMEN	Ral-Haf	Yemen I NG Total Yemen Gas Hunt Oil SK Group Hyundoi	2010	2	6.7	2	320.000
	Darria		0 0 0	· -	0.1	4	020,000



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World LNG Carrier Fleet

LNG Carrier	Capacity m ³	/ Registered Owner	Builder	Deli	very 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 Khattiya	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 Schiffsbetriebsgesellschaf mbH & Company ts Alexandra KG	t 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	t 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	ННІ	Apr-20	Malta	X-DF	TZ MK. III Flex	-	Portfolio	3021
Amur River	149,700	Seacrown Maritime	ННІ	Nov-07	M. Islnds.	Steam	TZ Mk. III	4	Sakhalin II	1734
Arctic Aurora	155,000	Fareastern Shipping	ННІ	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

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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	MF-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 /00	BD BD	Daewoo	lun_18	Isle of Man	ME-GI		4	Freeport	2440
British Sapphire	155 000	BRSSAF (10) I td	нні		Isle of Man	Diesel/Gas-Electric		4	Portfolio	1770
British Sappine	172 644		Deewee	May 10	Isle of Man	ME CI		4	Fraggert	2446
	173,044		Miteuri ESS	Apr 00		Steem	GT NO 90 GW	4 5		2440
Broog	137,529	Mitsul O.S.K. Lines	Mitsui E&S	Apr-98	Japan	Steam		5	Qatargas I	1412
Bu Samra	266,000		Samsung	Dec-08	IVI. ISINGS.	-		5		1677
Bushu Maru	180,000	Mitsui O.S.K. Lines	Mitsubishi	Jul-19	Bahamas	Reheat Steam Turbine	e IZ 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	MF-GI	TZ Mk. III Flex	_	Portfolio	8188
Castillo De Merida	176,300	Empresa Naviera Elcano	Imabari Shinbuilding	Mar-18	Spain	ME-GI	TZ MK. III Flex	4	Portfolio	8177
Castillo de Santisteban	170 000	Naviera Trans Gas AIF	STX	Jun-10	Malta	Diesel Electric	GT NO 96	4	Portfolio	3008
Castillo de Villalba	138 000	Empresa Naviera Elcano	Navantia Cadiz	Sen_02	Snain	Steam	GT NO 96	4	Portfolio	87
Catalunva Spirit	138 000	Teekay Shinning Shain S I		.lun_02	Spain	Steam			Atlantic LNC	210
	180,000	Yiang CH27 UK Internetional	Sameung	Jan 01	Maraball Isl	Y_DF				2200
	190,000		Samoung		Marahall ISI.	X DE		4		2230
	100,000		Samsung	Aug-21				4		2314
	100,000		Samsung	Jun-21				4		2313
	180,000	Greenneart Gas Shipco I LLC	Samsung	INOV-20	Bermuda			4		2297
	1/4,000	Transportation Co.	Hudong ∠honghua	Jun-17	H.K., China	UTUS	GINO 96	4	APLNG	1/17A
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



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CESI Qingdag	174 000	China Shinning Co	Hudong Zhonghua	Feb-17	HK China	DEDS	GT NO 96	4		17164
CESI Tianiin	174,000	COSCO Shipping Co.	Hudong Zhonghua	Jul-17	China	TEDE	GT NO 96	4	APLNG	1718A
	,	Transportation Co.			•					
CESI Wenzhou	174,000	COSCO Shipping Energy	Hudong Zhonghua	Feb-18	China	Diesel-Electric	GT NO 96	4	APLNG	1719A
Cheikh Bouamama	75.558	Skikda I NG Transport Corp.	Universal SB	Jul-08	Liberia	Steam	TZ Mk. III	4	Arzew/Skikda	88
Cheikh el Mokrani	75,759	Mediterranean LNG Transport Corr	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 Energy	149,700	Pegasus Shipholding	ННІ	Mar-07	M. Isinds.	Steam	TZ Mk. III	4	Portfolio	1748
Clean Horizon	162 000	Dynagas	ННІ	Apr-15	Malta	Diesel/Gas-Electric	TZ Mk. III Flex	4	Portfolio	2566
Clean Ocean	162,000	Dynagas	нні	May_1/	Malta M. Jelnde	Diesel/Gas-Electric	TZ Mk. III Flex	4	Sabine Pass	2558
Clean Dianat	162,000	Dynagas Tankara Managamant		Aug 14	M. Isinds.	Diesel/Gas-Liectric		4	Vamal	L12565
	102,000			Aug-14	IVI. ISIIIUS.	Diesel Electric		4	Dartfalia	0507
	162,000		HHI	Aug-15	Maita	Diesel/Gas-Electric		4	Portiolio	2507
CNTIC VPower Energy	127,500			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	IZ 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	Hudong Zhonghua	Jul-08	H.K., China	Steam	GT NO 96	4	Pluto	1309
	,	Management Co.	······g _····g····		,			-		
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	Savaringo	4	Cameron	2325
Diamond Gas Rose	165,000	NYK Line	Mitsubishi	Aug-18	Bahamas	STaGE	Savaringo	4	Cameron	2325
Diamond Gas Sakura	165,000	Tokyo Gas	Janan Marine United	May-19	Panama	STaGE	Savaringo	4	Cameron	2332
Diamond Gas Victoria	174 000	Diamond LNG Shipping 6 Bto Ltd		lup 21	Rahamas	V DE		4	Gameron	8031
Diamonu Gas victoria	174,000	India LNC Transport Company			Malta			4	-	0031
DISITA	130,025	No.1 Ltd.	Daewoo	Dec-03	Ivialla	Gas Turbine	GT NO 90	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 Schiffsbetriebsgesellschat	t Daewoo	Dec-07	Bahamas	Diesel	GT NO 96	4	Qatargas II	2247
	2.0,.00	mbH & Company ts Gabriela KG		200 0.	Danamao	2.000	0		Quita guo i	
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
Flisa Larus	174,000	Caroline 77 SASU	Hvundai Samho	May-20	France	X-DF	TZ Mk. III Flex	4	Portfolio	S970
Energy Advance	147 624	Tokyo I NG Tanker Co. & Toho	Kawasaki	Mar-05	Janan	Steam	Moss	4	Portfolio	1521
Energy Advance	147,024	LNG Shipping Co.	Kawabaki	Mar 00	oupun	oteam	Weee	-		1021
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	Tokvo 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	TEDE	TZ Mk. III Flex+	4	Cove Point	5071
Energy Horizon	177 000	Tokyo I NG Tanker Co. & NYK	Kawasaki	Aug-11	Janan	Steam	Moss	4	Pluto	1664
Energy Inpoyator	165,000	Tokyo Gos	Japan Marina United		Banama	TEDE	TZ Mk III Eloxt	4	Covo Point	5072
	172 400	Mozart Novigation SA		May 21	Milaina	MECL		4	Coveronit	2495
	173,400		Daewoo	Iviay-21	IVI. ISITIUS.	ME-GI	GT NO 90 GW	4	_	2400
Energy Intelligence	173,400	Strauss Navigation SA	Daewoo	Jun-21	M. Isinds.	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	Mav-17	Cyprus	TFDE - Azipod	GT NO 96 GW	4	Yamal	2422
Flex Amber	174.000	Bund 10 Holding I td	HHI	Oct-20	M. Islnds	X-DF	TZ Mk. III Flex	4	Portfolio	8011
Flex Artemis	174 000	Flex I NG Rreliance I td	Daewoo	Aug-20	M Islnde	ME-GI	NO-96-GW/+EPS	4	Portfolio	2479
	17/ 000		НП	lup 20	M. Isinus.			т Л	Portfolio	8010
	174,000	LING AUTOID LLU.	100	Juli-20	IVI. ISIIIUS.		IZ IVIK. III FIEX	4		0010

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Flex Constellation	173 400	Frontline	Daewoo	lun-19	M Islnds	ME-GI	NO-96-GW+PRS	4	Portfolio	H2470
Flex Courageous	173,400	Frontline	Daewoo	Aug-19	M Isinds	ME-GI	NO-96-GW+PRS	4	_	2471
Flex Endeavour	172 400	Flex I NG	Daewoo	.lan-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 I td.	Daewoo	Jan-21	M. Islnds.	ME-GI	NO-96-GW+FRS	4	Portfolio	2492
Flex Rainbow	174 000	Flex I NG	Samsung	Jun-18	Isle of Man	ME-GI	TZ Mk III Flex	4	_	2108
Flex Ranger	174,000	Flex LNG	Samsung	Jun-18	Isle of Man	ME-GI	TZ Mk. III Flex	4	_	2100
Flex Resolute	173 400	Flex LNG Resolute Ltd	нні	Sen-20	M Isinds	ME-GI	NO-96-GW+ERS	4	Portfolio	2480
Flex Vigilant	174 000	Flex Vigilant I td	нні	May-21	l iberia		TZ Mk III Fley	4	Portfolio	8013
Flox Voluntoor	174,000	Flox Voluntoor Ltd		lon 21	Milelade	X-DI		4	1 Ortiono	8012
Freibe	210,100		Degwee		M. Joindo	Diagol		4	- BaaCaa III	2252
	210,100		Kawaaaki	Aug-00	Molto	Steem	GT NO 90	10	RasGas III	1507
	149,172	Alethela Owning Co.	Compund	Ivial-04	Bahamaa	Steam		4		1406
	138,200	Camartina Shipping Co.	Samsung	Jan-04	Banamas	Steam		4	RasGas II	1406
	180,000	Primavera Montana SA	Daewoo	Feb-21	M. Isinas.	X-DF	GT NO 96 GW	4	Portfolio	2499
	140,624		Daewoo	Jui-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
Gasl og Warsaw	180,000	Gaslog	Samsung	Jul-19	Bermuda	X-DF	TZ Mk. III Flex+	4	Portfolio	2212
Gasl og Wellington	176 400	GAS-Thirty Four Ltd	Samsung	Jun-21	Bermuda	X-DF	TZ Mk III Flex+	4	US Portfolio	2311
Gasl og Westminster	180,000	Gas-Thirty I td	Samsung	Jul-20	MAlta	X-DF	TZ Mk. III Flex	4	Portfolio	2262
Gasl og Winchester	176 400	Gas-Thirty Five I td	Samsung	Aug-21	Bermuda	X-DF	TZ Mk. III Flex+	4	LIS Portfolio	2312
GasLog Windsor	180,000	Gasl og	Samsung	Δpr-20	Bermuda	X-DF	TZ Mk. III Flex	4	Portfolio	2212
Germata	135 260	Shell Bermuda (Overseas) Ltd	Miteubishi	Eeb_0/	Singapore	Steam	Moss	5	Peru I NG	2183
Goorgiv Brusilov	172 / 10	Arctic LNG 3 Ltd	Doowoo	Nov 18	Cuprus			1	Vamal	2100
Georgiy Lisbakay	172,410	Arctic Ling 5 Lid.	Daewoo	NOV-10	Babamaa		GT NO 96 GW	4	Vamal	2427
Georgiy Usilakuv	127,002	Chacha Inc		Sep-19	Liborio	ME-GI	Mana	4		1202
Giasia	137,000			Jun-95	Liberia	Steam		5	Das Island	1392
	177,419	Cleopatra LNG Snipping Co.	HHI	Feb-10	Banamas			4	RasGas	1876
Global Energy	74,100	GDF Armateur 2	SIX	Jan-04	France	Diesel/Gas-Electric		4	Portfolio	32M
	1/3,400	Hai Kuo Shipping 2118G Ltd.	Daewoo	May-20	Greece	ME-GI	GT NO 96 GW	4	Portfolio	24/8
Global Sea Spirit	169,932	Global Sea Spirit Inc	Daewoo	Oct-21	Greece	ME-GI	-	4	US Portfolio	2502
Global Star	1/3,400	Hai Kuo Shipping 2119G Ltd.	Daewoo	Jan-21	M. Isinds.	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

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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 Snipping Co.	Hanjin (Busan)	Sep-95	Panama	Steam	GT NO 96	4	Bontang	16
	130,214		Hanjin (Busan)	Jui-00	Panama	Steam	GT NO 96	4	Oman LNG	61
Hellas Athina	170 520		Hyundai Sambo	Sep-21	Malta		TZ Mk III Elex	4	Portfolio	8040
Hellas Diana	174.000		Hyundai Samho	Mar-21	Malta	X-DF	TZ Mk. III Flex	4	Portfolio	8039
Hispania Spirit	145 500	Teekay Gas Naviera SI			Snain	Steam	GT NO 96	4	Peru I NG	2205
HongKong Energy	138.000	Chevron LNG Shipping Co.	Daewoo	Feb-04	Australia	Steam	GT NO 96	4	North West Shelf	2214
Hvundai Aquapia	137.415	H&S Shipping	HHI	Mav-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	ННІ	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	ННІ	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
lsh	137,000	Ish Inc.	Mitsubishi	Nov-95	Liberia	Steam	Moss	5	Das Island	2067
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
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	ННІ	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	ННІ	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	ННІ	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
	174,000	Mitsui O.S.K. Lines	Hudong Zhonghua	Nov-19	Panama	ME-GI	GT NO 96 L03+	4	Yamal	1810A
LNG Dubhe		I NG Ebisu Shipping Corp	Kawasaki	Jul-08	Bahamas	_	Moss	4	Pluto	1588
LNG Dubhe	147,546	Ento Ebiod onipping ooip.		0 1 0 1	France	X-DF	TZ Mk. III Flex	4	Portfolio	0055
LNG Dubhe LNG Ebisu LNG Endeavour	147,546 170,520	Fortune Great Shipping Ltd.	Samsung	Oct-21	Trance			•	1 OITIOIO	2355
LNG Dubhe LNG Ebisu LNG Endeavour LNG Endurance	147,546 170,520 170,520	Fortune Great Shipping Ltd. DuPlessis Bail SNC	Samsung Samsung	Oct-21 Dec-21	France	X-DF	TZ Mk. III Flex	4	Portfolio	2355
LNG Dubhe LNG Ebisu LNG Endeavour LNG Endurance LNG Enterprise	147,546 170,520 170,520 170,520	Fortune Great Shipping Usip: DuPlessis Bail SNC Hanovre Financement 20 SASU	Samsung Samsung Samsung	Oct-21 Dec-21 Oct-21	France France	X-DF X-DF	TZ Mk. III Flex TZ Mk. III Flex	4	Portfolio Portfolio	2355 2307 2360
LNG Dubhe LNG Ebisu LNG Endeavour LNG Endurance LNG Enterprise LNG Enugu	147,546 170,520 170,520 170,520 145,926	Fortune Great Shipping Gotp: DuPlessis Bail SNC Hanovre Financement 20 SASU BW Gas LNG Carriers	Samsung Samsung Samsung Daewoo	Oct-21 Dec-21 Oct-21 Oct-05	France France Bermuda	X-DF X-DF Steam	TZ Mk. III Flex TZ Mk. III Flex GT NO 96	4 4 4 4	Portfolio Portfolio NLNG	2355 2307 2360 2222
LNG Dubhe LNG Ebisu LNG Endeavour LNG Endurance LNG Enterprise LNG Enugu LNG Finima II	147,546 170,520 170,520 170,520 145,926 162,000	Fortune Great Shipping Gotp. Fortune Great Shipping Ltd. DuPlessis Bail SNC Hanovre Financement 20 SASU BW Gas LNG Carriers Bonny Gas Transport	Samsung Samsung Samsung Daewoo Samsung	Oct-21 Dec-21 Oct-21 Oct-05 Dec-15	France France Bermuda Bermuda	X-DF X-DF Steam	TZ Mk. III Flex TZ Mk. III Flex GT NO 96 TZ Mk. III Flex	4 4 4 4	Portfolio Portfolio NLNG NLNG	2355 2307 2360 2222 2076
LNG Dubhe LNG Ebisu LNG Endeavour LNG Endurance LNG Enterprise LNG Enugu LNG Finima II LNG Fukurokuju	147,546 170,520 170,520 170,520 145,926 162,000 164,700	Fortune Great Shipping Gotp. Fortune Great Shipping Ltd. DuPlessis Bail SNC Hanovre Financement 20 SASU BW Gas LNG Carriers Bonny Gas Transport Mitsui O.S.K. Lines	Samsung Samsung Samsung Daewoo Samsung Kawasaki	Oct-21 Dec-21 Oct-21 Oct-05 Dec-15 Jul-16	France France Bermuda Bermuda Panama	X-DF X-DF Steam - Steam	TZ Mk. III Flex TZ Mk. III Flex GT NO 96 TZ Mk. III Flex Moss	4 4 4 4 4 4	Portfolio Portfolio NLNG NLNG APLNG	2355 2307 2360 2222 2076 1712
LNG Dubhe LNG Ebisu LNG Endeavour LNG Endurance LNG Enterprise LNG Enugu LNG Finima II LNG Fukurokuju LNG Imo	147,546 170,520 170,520 145,926 162,000 164,700 148,452	Fortune Great Shipping Gotp. Fortune Great Shipping Ltd. DuPlessis Bail SNC Hanovre Financement 20 SASU BW Gas LNG Carriers Bonny Gas Transport Mitsui O.S.K. Lines Bergesen LNG XI Ltd.	Samsung Samsung Daewoo Samsung Kawasaki Daewoo	Oct-21 Dec-21 Oct-21 Oct-05 Dec-15 Jul-16 Jun-08	France France Bermuda Bermuda Panama Bermuda	X-DF X-DF Steam - Steam -	TZ Mk. III Flex TZ Mk. III Flex GT NO 96 TZ Mk. III Flex Moss GT NO 96	4 4 4 4 4 4 4	Portfolio Portfolio NLNG NLNG APLNG NLNG	2355 2307 2360 2222 2076 1712 2232

STaGE

Moss

LNG Juno

180,000 Mitsui O.S.K. Lines

Mitsubishi

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I NG Jupiter	153 000	Osaka Gas Consortium	Kawasaki	.lul-09	Panama	Steam	Moss	4	PNGLNG	1592
LNG Jurojin	160,000	LNG Jurojin Shipping Corp.	Mitsubishi	Nov-15	Bahamas	Steam	Moss	4	Portfolio	2299
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. Isinds.	X-DF	GT NO 96 GW	4	Portfolio	2498
LNG Sakura	177,000	Mitsui O.S.K. Lines	Kawasaki	Feb-18	Bahamas		Moss	-	Freeport	1/31
	155,300	Mitsui O.S.K. Lines	Nitsubishi	FeD-16	Banamas			4	Gorgon	2311
	127 425	Reppy Coo Tropport		Sep-10	Bermuda	IFDE	GT NO 96 GW			1206
	15/ 425	GDE Armateur 2		Nov-06	France	– Diesel/Gas-Electric	CS1	4	Portfolio	32N
	153 000		Miteubishi	Nov-14	lanan		Savaendo	4	North West Shelf	2205
	127 386	Tokyo I NG Tanker Co	Mitsubishi	lun_94	Japan	- Steam	Moss	4		2233
INGShips Athena	170 618	Cardiff LNG lota Owning LLC	HHI	Mar-21	Malta	X-DF	TZ Mk III Flex	4	_	112
INGShips Empress	174,000	Cardiff LNG Kappa Owning LLC	Samsung	Mar-21	Malta	X-DF	TZ Mk. III Flex	4	OCLNG	2380
I NGShips 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	Sovo	1812
Lusail	145.000	Peninsula LNG Transport No. 1	Samsung	Mav-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	IZ Mk. III Flex	4	Portfolio	2507
Maran Gas Leto	174,000	Maran Gas Maritime	Hyundai Samho	Mar-16	Greece	DFDS		4	Portfolio	5688
Maran Gas Lindos	161,870	Maran Gas Maritime	Daewoo	JUI-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 Deriolas	173 400	Maran Gas Maritima	Hyundai Samba		Greece			_	Portfolio	2410
Maran Gas Pericles	161.970	Maran Gas Maritime	Hyundai Samho	Aug-16	Greece	DFDS		4	Portiolio Bunto Europo	5734
Maran Gas Pearo	173 505	Highseas Shintrade Co		May_14	Greece	- ME-GI		4 4	Portfolio	2460
Maran Gas Poyano	174 000	Maran Gas Maritima	Лаемоо	.lan-17	Greece	ME-GI	GT NO 96 1 02	- Δ	Portfolio	2403
Maran Gas Sparta	159 800	Maran Gas Maritime	Hyundai Sambo	Anr-15	Greece			-1		S626
Maran Gas Snetses	173 400	Maran Gas Maritime	Daewoo	Jul-18	Greece	MF-GI	GT NO 96 GW	4	GoM	2458
Maran Gas Trov	155.000	Maran Gas Maritime	Daewoo	Sep-15	Greece	DFDS	GT NO 96 I 03	4	_	2406
Maran Gas Ulvsses	173,400	Maran Gas Maritime	Hyundai Samho	Jan-17	Greece	Diesel/Gas-Flectric	TZ Mk. III Flex	_	Portfolio	\$735
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
	,	11: 0	5							

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Kaliningrad LNG

Cameron

Cameron

TZ Mk. III Flex

Moss

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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	TEDE	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		Sameung	Apr 21	Donmark			1	Californi	2210
Marver Swall	472.400	Taskey INC Darts are	Danuar	Apr-2 1	Dehamark	ME OI		4	- Dautfalia	2310
	173,400	Teekay LNG Partners	Daewoo	Jul-18	Banamas	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	Llovds 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	ldku	1554
Methane Julia Louise	170.000	Methane Services (Shell)	Sameung	Apr-10	Bermuda	_		9	Singanore	17/5
Methane Keri Elin	400.007		Camating	Api-10	Dermuda			3	Ciagapore	1/40
	138,267	BG Group	Samsung	May-04	Bermuda	Steam		4	Singapore	1428
Methane Lydon Volney	145,000	BG Group	Samsung	Aug-06	Bermuda	Steam	I Z MK. III	4	ldku	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	ldku	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	ldku	1553
Methane Shirley Elisabet	h145 000	Llovds TSB Leasing No 8 Ltd	Samsung	Feb-07	Bermuda	Steam	TZ Mk III	4	Punta Europa	1585
Mothano Spirit	165 500	Malt Singaporo Put Ltd	Samsung	Fob 08	M Islads	Diesel/Cas Electric		1	Atlantic LNG	1607
	105,500		Samsung	Feb-00	IVI. ISITIUS.	Diesei/Gas-Electric		4		1007
Milaha Qatar	145,500	Qatar Shipping Co.	Samsung	Apr-06	Malta	Steam	I Z 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	.lan-21	Malta	_	GT NO 96 GW	4	_	2481
MOL Hestia	173 /00	ING Harmonia Shipping Corp	Daewoo	Jul-21	M leinde	X-DE		1		2505
	000,000	National Shipping Corp	Daewoo	Jui-2 1	M. Islands.	N-DI		4	-	2000
Mozan	266,000		Samsung	Aug-09	w. isinds.	Diesei		5	Qatargas II	1675
Mraweh	137,000	Mraweh Ltd.	SIX	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 Urvantsov	172 658	China Shinning Development Co	Daowoo	101 10	HK China	MEGI		1	Vamal	2432
	172,000	China Shipping Development Co.	Daewoo	Jui-19	n.r., China	ME-GI	GT NO 90 GW	4	f annai	2432
Nikolay Yevgenov	172,410	Геекау Согр.	Daewoo	Apr-19	Banamas	ME-GI	GT NO 96 GW	4	Yamai	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 I NG Partners	Daewoo	Mar-16	Bahamas	ME-GI	GT NO 96 GW	_	Sabine Pass	2408
Oh Biyor	140 700			May 07	M Jolndo	Stoom		4	Sakhalin II	1710
	155,100		Mitouhiah:	Apr 10	Ivi. ISILIUS.	Debect Sterre Tout				1/18
	100,300	K LINE - KAWASAKI KISEN KAISha	IVIIISUDISNI	Apr-18	Japan	Reneat Steam Turbine		4	iontnys	2310
Unaiza	210,150	Nakilat DSME 2266 Inc.	Daewoo	Apr-09	M. Islnds.	Diesel	GT NO 96	12	Qatargas III	2266
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	Sen-03	Bahamas	Steam	Moss	5	Darwin I NG	2176
Palu I NG	150 800	Cardiff LNG		Nov 14	Malto	TEDE		1	Spot	2/00
	174 000		Hudong Thorsburg	lon 10		TEDE				16664
Pan Airica	174,000	LING Partners	nuaong ∠nonghua	Jan-19	п.к., Cnina	IFUE	GT NO 96	4	QULING	Addor

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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
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	CardiffF LNG Delta Owning LLC	Samsung	Aua-20	Malta	X-DF	NO-96-GW+PRS	4	Portfolio	2275
Point Fortin	154.200	Los Halillos Shipping Co.	Kovo Dockvard	Jan-10	Panama	Steam	TZ Mk. III	4	Portfolio	2263
Polar Spirit	89.800	Polar Spirit LLC	Ishikawaiima	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
Portovvv	138 107	Monteriagioni Inc	Daewoo		Belgium	Steam	GT NO 96	4	Portfolio	2213
Prachi	162 000	India I NG Transport Company	нні	Nov-16	Singanore	Diesel/Gas-Electric	T7 Mk III Flex	-	Corgon	2633
	102,000	No. 4 Ltd.		100-10	Singapore	Diesel/Oas-Liectric			Corgon	2000
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	Malavsia	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	MINGI	30H
Puteri Zamrud Satu	137 100	MISC	Mitsui F&S	Feb-04	Malaysia	_	GT NO 96	4		1507
	174 000	INGShips	Samsung	.lun-20	Malta	X-DF	TZ MK III Flex	_	Portfolio	2271
Raahi	138 076	India I NG Transport Company	Daewoo	Oct-04	Malta	Steam	GT NO 96	4	RasGas	2211
	100,070	No.2 Ltd.	Ducinot	001 04	Matta	olean		-		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 Knutser	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
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	Malavsia	Ultra Steam Turbine	TZ MK. III Flex	4	Pacific Northwest	2729
Seri Cemara	150.200	MISC	HHI	Apr-18	Malavsia	Ultra Steam Turbine	Moss	4	Portfolio	2735
Seri Cempaka	162.000	MISC	HHI	Aua-17	Malavsia	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		May_10	Spain	Diesel/Gas-Electric	GT NO 96	4	Portfolio	2269
Shagra	268.000	Nakilat SHI 1751 Inc	Samsung	Nov-09	M Isinds	Diesel	T7 Mk III	10		1751
Shahamah	135 406	Shahamah Inc	Kawasaki	Oct 94	Liborio	Stoom	Moss	5	Das Island	1/30
Shen Hai	147 200	Shanghai LNG Shipping Co	Hudong Zhonghug	Dec_12	HK China	Steam	GT NO 96	4	Bintulu	H1621A
Shinehu Moru	180.000		Kawasaki	Ech 10	lanon	DERCT (aka STACE)	Moss	-+	Freeport	1794
Simaiemo	145 000	Greenwell Corporation		100-13	Bormuda	Steam		+ 2		1734 2225
Singaporo Eporav	139 000		Sameung	Fob 02		Steam		1	Dortfolio	1/10
	174 000	Milostono LNC Transat	Samsung		Danama	Y DE		4		1410
	100,000		Samsung	Aug-17	Panara			4		2080
SK Resolute	100,000		Samsung		Panama			4	Cohine Desi	2081
Sit Seletility	174,000	on onippling	Samsung	Len-19	South Korea		NG-1	4	Sauthe Pass	2103



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SK Spica	17/ 117	SK Shipping	Sameung	Mar-18	South Korea	TEDE	KC-1		Sahing Pass	2154
SK Splendor	138 370	Ontima Leasing	Samsung	May-00	Panama	Steam			Oman I NG	1258
SK Stollar	139 375	Stollar Shinholding	Samsung		Panama	Stoom		4	BasGas I	1250
	130,373		Samsung		Panama	Steam		4	RasGas I	1209
	130,003	Methana Navination C A	Daewoo	Aug-99	Panama	Steam	GT NU 96	4	RasGas I	2202
SK Sunrise	138,306	Methane Navigation S.A.	Samsung	Aug-03	Panama	Steam		4		1405
SK Supreme	138,225	Celeste Maritime	Samsung	Feb-00	Panama	Steam	IZ 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	Sovo	1810
Spirit of Hela	177.000	Nefertiti LNG Shipping Co.	Hvundai Samho	Nov-10	Bahamas	Diesel Electric	TZ Mk. III	4	PNG LNG	S324
Stena Blue Sky	145 700	Blue Sky I NG	Daewoo	Aug-06	Panama	Steam	GT NO 96	4	Spot	2233
Stena Clear Sky	171 800	Clear Sky I NG Shipping	Daewoo	May-11		Diesel/Gas-Electric	GT NO 96	4	Portfolio	2278
Stona Crystal Sky	171,000	Stopa Drilling Cyprus	Daewoo	May 11		Diesel/Gas-Electric	GT NO 96	4	Portfolio	2210
Sumphonia Proozo	1/1,000	Beharn Maritima	Kawaaaki	Dog 07	D.K.	Stoom	Mono	4	Portfolio	L1507
	145,594		Nitauhiahi	Dec-07	Danamas	Steam	Mass	4		0044
	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	l 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
Tessala	170.000	Hyproc Shipping Co.	ННІ	Feb-17	Algeria	Diesel/Gas-Electric	TZ Mk. III Flex	_	Arzew	2813
Torben Spirit	173 400	Teekay I NG Partners	Daewoo	Nov-16	Bahamas	ME-GI	GT NO 96 GW	_	Portfolio	2411
Trader	138 000	K Line LNG Shipping (LIK) Ltd	Samsung	Nov-02	Isle of Man	Steam		A	Portfolio	1380
Traiano Knutson	180,000	Hai Kuo Shipping 1901 G Ltd		Jul 20	Bolgium	MEGI	TZ Mk. III Elox	4	Portfolio	3086
	154 092	Luster Maritima S.A. & Cuprasa	Kaya Daakyard	Jul-20	Dengium	Stoom		4	Portfolio	2000
Thinty Arrow	154,962	Maritime Panama & Los Halillos Shipping Co.	KUYU DUCKYAIU	Feb-00	Fallallia	Steam	1 Z IVIK. III	4	Fortiolio	2250
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 Isinds	_	TZ Mk III	5	Oatargas II	1676
Valencia Knutsen	173 400		Daewoo	Sen-10	Spain	_	GT NO 96	4	Portfolio	2274
Volikiy Novgorod	170,400	Soveemflet	STY	Doc 13	Liboria		GT NO 96	4	Portfolio	1010
	170,200			Dec-13			GT NO 90	4	Portfolio	1910
	174,000	Cardin ENG Zeta Owning ELC		Oci-20	Maila	X-DF		4	Portiolio	3037
	174,103	Kaiser SA	Hyundai Samno	Dec-21	Liberia	X-DF		4	Portiolio	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 NG Partners	Hyundai Sambo	Jan-19	Bermuda	ME-GI	TZ Mk III Flev	-	Freeport	S857
Yari I NG	150 200	Cardiff I NG		Nov-14	Malta		GT NO 96 L 02	4	Snot	2401
	155,000			101 12	Milalada			-+	Vamal	2401
Vionnic	100,000			Jui-13	IVI. ISITIUS.	- ME CI		4		2000
	109,932			Sep-21	Greece		GT NU 96 GW	4		2501
	127,125	Sr. Snipping	ппі	Dec-94	ranama	Steam	IVIOSS	4		/01
∠arga	268,000	Nakilat SHI 1752 Inc.	Samsung	Jan-10	M. Islnds.	-	IZ 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

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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 Vermogensverwaltung	Hyundai Mipo	Cyprus	Gas-Diesel	Туре С	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 FI	ex 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	Туре С	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 Fle	x 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

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