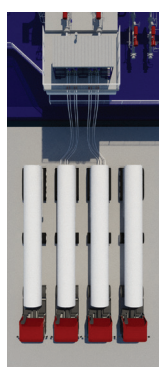


LNG 4 *speed*



Where infrastructure is missing
we have the solution.

The **LNG4Speed** allows an improvement in logistics and distribution which will be feasible also in remote locations. This system is designed for starting LNG efficient distribution by truck without any fixed infrastructure or terminal onshore.



» Ship to truck

» Truck to ship

» Ship to ship



www.gasandheat.com



KONGSBERG

For decades, we've equipped a third of the **world's fleet** for a sustainable future

Our deep understanding translates into solutions
tailored to your specific needs. Partner with us and
unlock a more sustainable future for your business.
kongsberg.com/maritime

Kongsberg Maritime – Pro**tech**ting People and Planet

In this issue:

- 1

Egypt secures Höegh FSRU for temporary deployment from June

Egypt's EGATeagerly awaits arrival of the 'FSRU Höegh Gallon' at Ain Sokhna port. The FSRU has been sub-chartered for up to 20 months to preempt the risk of fuel shortages
- 4

Turkey's gas hub quest: Looking for the LNG accelerator

A major legislative change, market conditions and the ongoing development of offshore gas resources have raised prospects of Turkey evolving into a gas hub using surplus imports and even its own production
- 8

Preliminary data points to ongoing monthly trade decrease

Our May data showed another LNG trade decrease globally following a slump in April
- 12

First 'Changheng' series LNGC delivered

On 15th May, the world's first fifth-generation 'Changheng' series of 174,000 cu m LNGCs, 'Greenergy Ocean', was named and delivered five months ahead of schedule
- 12

KR addresses cryogenic insulation materials

The Korean Register of Shipping (KR) has published a research report entitled 'Guide to Selection of Thermal Properties for Cryogenic Insulation Materials'.
- 14

Port Canaveral prioritizes LNG fuelling in expansion plans

As demand for LNG as a maritime fuel continues to grow, the need to continually adapt capabilities can add operational drag for organisations
- 16

A round-up of latest events, company and industry news

For the Record
- 21

Tables of import and export LNG terminals and plants worldwide

Egypt secures Höegh FSRU for temporary deployment from June

Höegh has thrown a lifeline to Egypt by agreeing to deploy a floating LNG import terminal, chartered to Australia, beforehand to the Arab nation to preempt fuel shortages. EGAS sub-chartered the FSRU 'Höegh Galleon' for service in the Gulf of Suez port of Ain Sokhna for up to 20 months, though extrapolating from ship tracking data the vessel is unlikely to arrive before the end of the first week of June; our Markets Editor Anja Karl investigates.

Sailing under the flag of Singapore, 'Höegh Galleon' has last been tracked off the West African islands Capo Verde and is scheduled to stop off Las Palmas on May 28. Thereafter, it still needs to cross the Mediterranean Sea and transit the Suez Cannel to reach Egypt's Ain Sokhna port in the Gulf of Suez, where it is designated to help EGAS avert a repeat of rolling blackouts this summer.

After its intermezzo at Ain Sokhna, the 'Höegh Galleon' will be deployed – as contractually agreed – at Australian Industrial Energy (AIE)'s LNG terminal which is currently under construction. The FSRU is ultimately still destined for Port Kembla in the Illawarra region of New South Wales, where it will serve as Australia's first regasification terminal.

Erik Nyheim, chief executive of Höegh LNG said the Norwegian shipping major is "pleased to provide Egypt with flexible infrastructure in support of energy security." A 15-year charter agreement for

the FSRU had been signed with AIE back in June 2022, while the new sub-charter deal with EAGAS is strictly for an interim period until February 2026.

Importing LNG via Jordan

Struggling to avert fuel shortages, Egypt had imported three cargoes via Jordan's Aqaba regasification terminal in the past 90 days for immediate delivery – one from Norway's Snohvit LNG terminal and two US cargoes from Cameron LNG and Sabine Pass, respectively (see table).

Market observers reckon over a dozen cargoes will have to be secured this spring and summer. Three imported LNG cargoes per month between July and October are deemed necessary to meet Egypt's fast-growing gas and electricity demand from a population of over 106 million.

From June onwards, the 'Höegh Galleon' will allow EGAS to import LNG directly to Egypt at the Gulf of Suez port

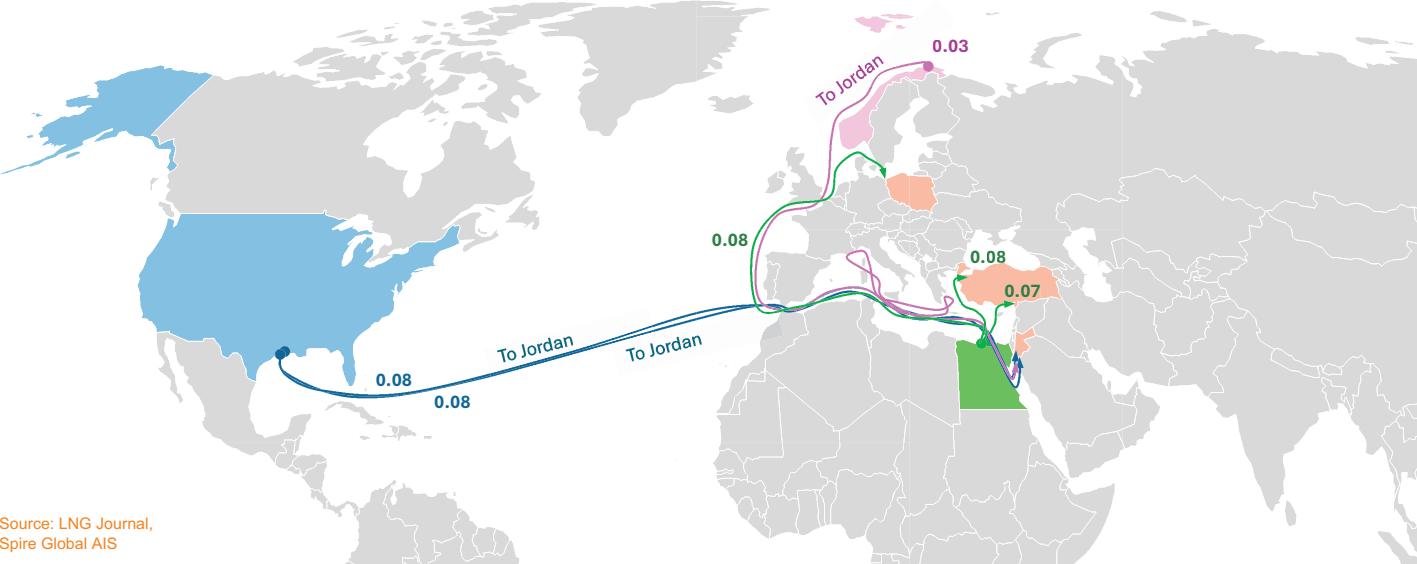
of Ain Sokhna – without having to plead Jordan for regas slots. The earlier chartered FSRU 'BW Singapore' had left Ain Sukhna in November 2023 when a charter agreement ended. Importing LNG via the Aqaba terminal in neighbouring Jordan has since been agreed as an option, but just in case of emergency.

Yet turning to imports will reverse Egypt's position as an exporter of gas to both neighbouring Israel and further afield. Discovery of the large Zohr gas field in 2015 had been instrumental for allowing Egypt to export LNG but there have been very few substantial discoveries since and natural gas production at existing fields is in decline. In 2023, output fell 11.5 percent year-on-year to 59.29 billion cubic metres (bcm) – the lowest level since 2017, and domestic production is likely to dwindle further.

Before tapping the Zohr field in the Eastern Mediterranean from 2017, Egypt had to import LNG for about two years.

LNG Flows: Egypt & Jordan

Past 90 days



Source: LNG Journal, Spire Global AIS

Export Country	Export Facility	Vessel Name	IMO Number	Sailed Date	Import Country	Import Facility	Arrival Date	MMt	Diverted from
Norway	Snohvit LNG	Seapeak Arwa	9339260	29/04/2024	Jordan	Aqaba LNG	25/05/2024	0.03	Revithoussa, Fos-sur-Mer
USA	Cameron LNG	Minerva Limnos	9854375	27/04/2024	Jordan	Aqaba LNG	20/05/2024	0.08	
USA	Sabine Pass LNG	Flex Volunteer	9862463	27/03/2024	Jordan	Aqaba LNG	13/04/2024	0.08	

LNG *journal*



The World's Leading LNG publication

Maritime Content Ltd

2 Prospect Road
St Albans AL1 2AX
United Kingdom
www.LNGjournal.com
+44 (0)20 7253 2700

Publisher

Stuart Fryer

Markets & Commissioning Editor

Anja Karl
anja@lngjournal.com

Markets Editor

Alexander Wilk
alexander@lngjournal.com

Technical Editor

Ian Cochran
lancochran74@gmail.com

Fuelling Editor

Malcolm Ramsay
malcolmrmsay@gmail.com

Advertising

David Jeffries, Only Media Ltd
Tel: +44 (0)20 8150 5293
djeffries@lngjournal.com

Subscriptions Sales Manager

Stephan Venter
venter@lngjournal.com

Subscriptions Renewals Manager & Customer Care

Gabi Weck
gabi@lngjournal.com

Production

Vivian Chee
chee@thedigitalship.com

Subscription

Print & online **£900/€1020/US\$1320**

Online only **£830/€920/US\$1190**

See website for more details
www.lngjournal.com
hotline +44 (0)20 7253 2700

No part of this publication may be reproduced or stored in any form by any mechanical, electronic, photocopying, recording or other means without the prior written consent of the publisher. Whilst the information and articles in LNG journal are published in good faith and every effort is made to check accuracy, readers should verify facts and statements direct with official sources before acting on them as the publisher can accept no responsibility in this respect. Any opinions expressed in this magazine should not be construed as those of the publisher.

Printed by The Manson Group Ltd
Reynolds House, 8 Porters' Wood
Valley Road Industrial Estate
St Albans, Herts AL3 6PZ, U.K.

Such imports were halted for more than five years in 2018 when domestic gas production facilitated regular exports via two liquefaction terminals at Idku and Damietta, with a combined capacity of 12.5 million tons per annum (mtpa).

Struggling to avert a gas deficit

Striving to honour contracts, Egypt's petroleum minister Tarek El Molla had been committed to exporting 80,000 tons of LNG to Europe in March and April 2024 – though these were the last cargoes shipped abroad. One cargo was left Egypt for Poland's Świnoujście regas terminal and two others were shipped to Turkey, according to Spire Global AIS data. Thereafter, Egypt stooped gas exports as of May to meet domestic demand as the government struggled to help utilities source enough fuel to avert a repeat of rolling blackouts like last summer.

Already this spring, Egypt nearly slipped into a gas deficit despite pipeline gas imports from Israel: Daily consumption of LNG is currently about 6 billion cubic feet (bcf) and likely to top 6.3 bcf during the summer, government sources told Al Arabia Business News. Daily production, meanwhile, is between 5.2 and 5.4 bcf and fully committed to the domestic market while gas imports from Israel reach 1.1 bcf per day.

With hotter weather arriving earlier this year and domestic reserves in fast decline, the government has been hard pressed to source enough fuel for power generation as the economy gathers pace after the Eid Al Fitr celebrations. Höegh LNG Holding now came to rescue by agreeing to deploy a FSRU chartered to Australia beforehand to Egypt for up to 20 months.



Jordan's Aquba LNG regas terminal



Egypt's Ain Sokhna port in the Gulf of Suez

Rolling blackouts not to be repeated

Acute fuel shortages and extended blackouts last summer and well into the autumn brought Egypt on the brink of public unrest, hence it is paramount for the government to avoid a repeat of energy shortages.

Gas imports from Israel ground to a halt in November last year, falling from 800 million cubic feet per day, after authorities in Israel mandated Chevron to suspend production at the Tamar field. The large field is situated offshore Israel's southern Mediterranean coast and not far from the Gaza strip where terrorists attacked Israeli civilians followed by months of military retaliation.

The fate of the three largest Israeli gas development projects – Tamar, Leviathan and Karish – greatly affects the regional market: Egypt imports about 7 bcm/y of natural gas from Tamar and Leviathan which helps meet domestic demand and feeds its two liquefaction plants – Idku LNG close to the city of Alexandria – and Damietta SEGAS LNG close to the Suez Canal. Analysts at Rystad Energy estimate that Egypt exported 3.7 million

tonnes of LNG between October 2022 and January 2023, with the peak at just less than 1 million tonnes in December 2022 – roughly equal to Tamar's 33-day production shutdown at current rates.

While Israel has alternatives, things look different for Egypt. Israeli energy ministry said at the time that “the economy's energy needs will be supplied by alternative fuels and utilities are preparing to use alternative fuels to power its stations.” For Egypt, in contrast, the suspension Tamar left most operators of gas-fired power plants out of fuel – an experience the government wants to avoid being repeated at all cost.

Wind energy could save \$5bn in gas cost

Wind power is one increasingly viable alternative to LNG-fuelled peaking power: Masdar, along with Infinity Power and Hassan Allam Utilities are a step closer to building a \$10 billion wind farm in Egypt, having just signed a land access agreement. Designed to produce 49,790 Gigawatt-hours (GWh) of electricity, the 10 GW wind farm will help save substantial amounts of imported coal and LNG.

The agreement gives the consortium access to a 3,035 square-kilometres area of land in West Suhag, and will allow the consortium to conduct the necessary development studies to progress the project. Once built and operational, the wind farm will produce 47,790 GWh of electricity per year.

With near-zero operating costs, the 10 GW wind farm will save the country an estimated \$5 billion in natural gas costs per year by reducing the need to dispatch gas-fired power stations. According to Infinity Power chairman Mohamed Ismail Mansour, “this source of clean energy will save Egypt money, reduce emissions and power industry across the country.” ■

Optimized Cascade® Process: The *trusted* liquefaction technology for LNG

With over 55 years of LNG design and operating expertise, ConocoPhillips has licensed **28 Optimized Cascade Process (OCP®)** trains around the world.

Choose OCP for industry-leading performance, including:

- Low-cost train designs for scalable, modular construction from **1.5 to 8 MTPA**.
- *Scalable configuration* to **8 MTPA** while maintaining high efficiency.
- Low emissions, highest availability and efficiency.
- Wide feed gas composition capability.
- Flexible over a wide operating range.



Learn more at
lnglicensing.conocophillips.com.

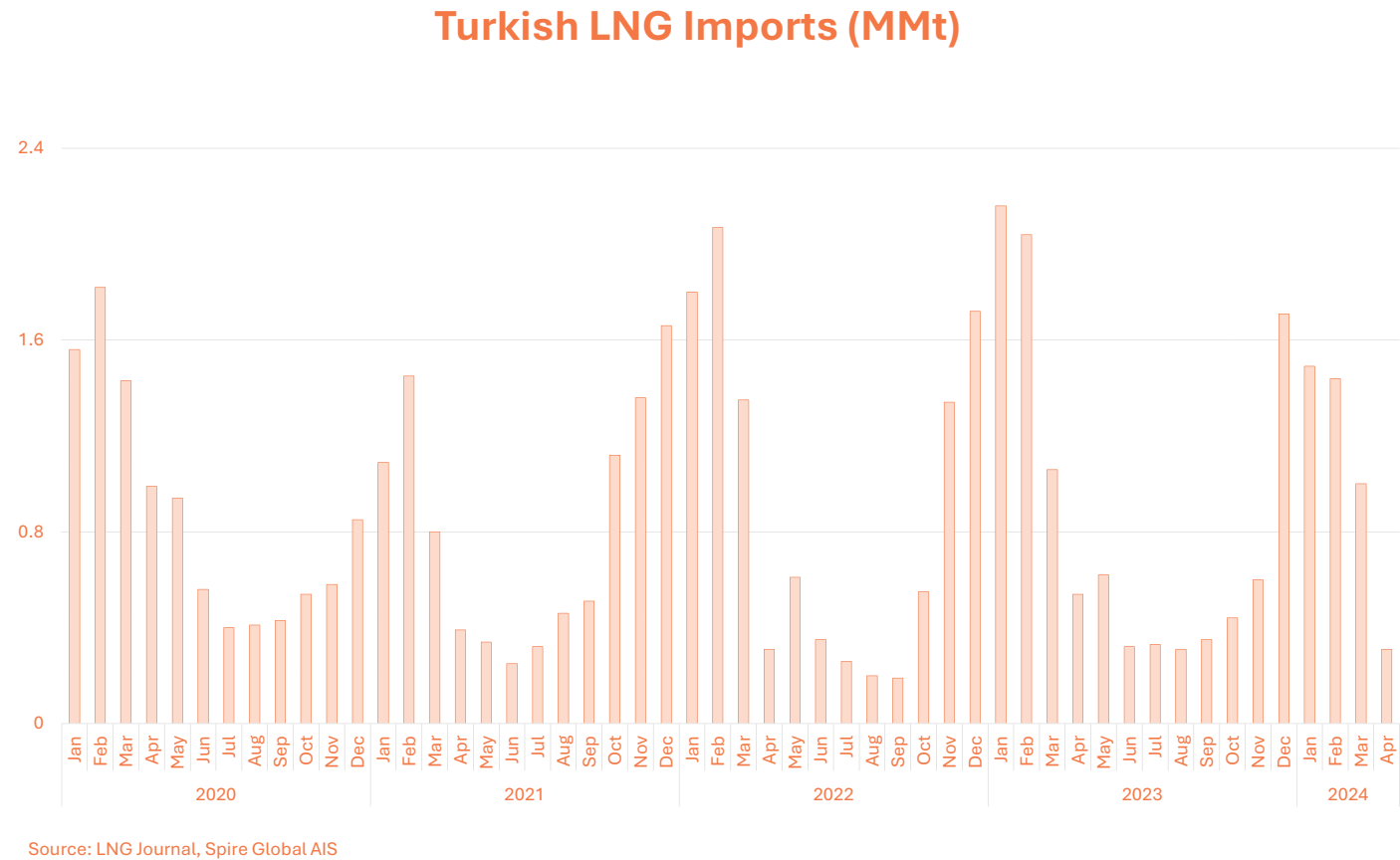


Turkey’s gas hub quest: Looking for the LNG accelerator

A major legislative change, market conditions and the ongoing development of offshore gas resources have raised prospects of Turkey evolving into a gas hub using surplus imports and even its own production. However, cautionary voices argue for the focus to lie on the re-export of surplus LNG instead, our Markets Editor Alexander Wilk reports.

Turkey's reliance on foreign energy sources has not only widened the state budget's current account deficit but also left the nation vulnerable to external shocks and fluctuations in global energy prices. Consequently, as we have reported previously, Turkish policymakers have devised and implemented strategies over time to diversify the country's energy supply. We have charted before Turkey's ambition to pivot away from long-term contracts with oil-linked prices and ‘Take or Pay’ obligations alongside destination clauses that prevented re-exports. Domestically, efforts have been made to bolster local energy production by developing natural gas resources in the Black Sea among others. Internationally, Turkey has strengthened ties with various supplier nations, both in its vicinity and beyond, to ensure consistent energy supply.

Nevertheless, total Turkish LNG imports in 1Q 2024 fell sharply by 1.33mmt (-25 percent) to 3.93mmt from 5.03mmt in 1Q 2023. This decrease followed strong seasonal demand growth in 2022 and 2023 and remains broadly on par with 1Q demand in 2021 and 2020. Meanwhile, Turkey’s pipeline gas imports have been on a downwards trend since 2020, amounting to an estimated 5.35 billion cubic metres (bcm) in 1Q



2024, based on ENTSOG data and LNG Journal calculations using nominal pipeline capacities. Notably, gas imports from Russia – both via pipeline and LNG – have bucked that trend and remained on a growth trajectory, according to Turkey’s energy market regulator EPDK. However, this did not negate a general decrease of Turkish gas imports.

Gas consumption

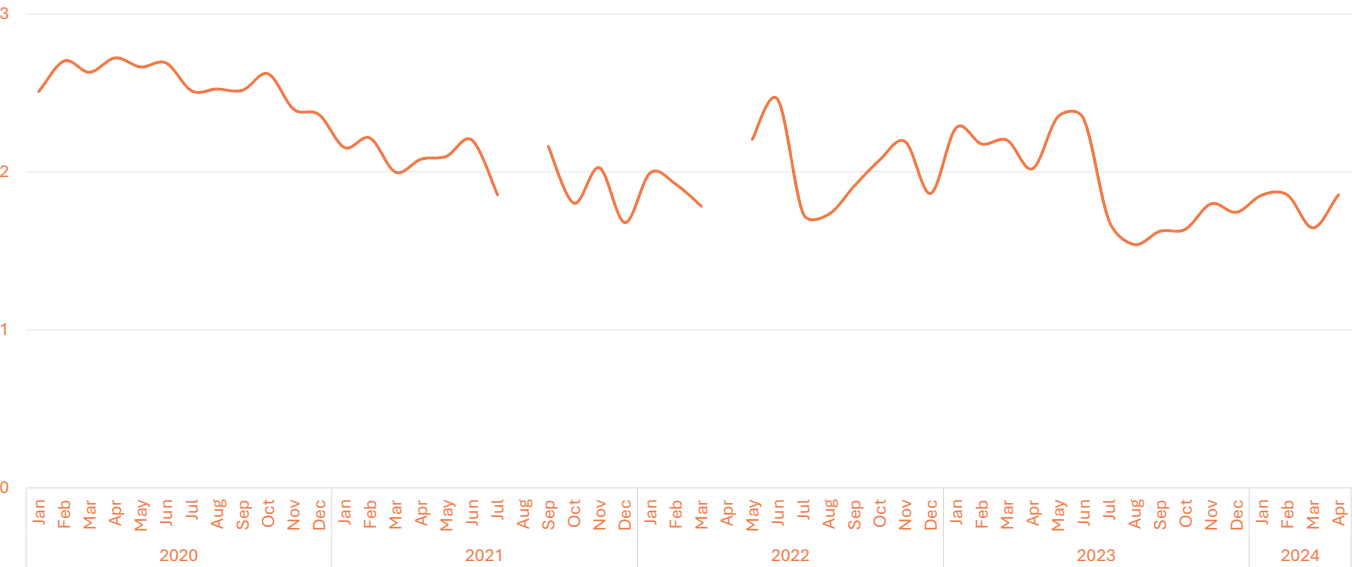
Key to that reduction is a decline in Turkish gas demand. In 2023, Turkey's natural gas consumption decreased by 3.20bcm (-6 percent) to 50.39bcm from 53.59bcm in 2022, according to data by the Natural Gas Distributors Union of Turkey (GAZBİR). GAZBİR accounts for the overall reduction through warmer weather, the use of alternative energy

sources in electricity generation, a general reduction in natural gas usage by industry as well as the impact of the Kahramanmaraş earthquakes affecting 11 Turkish provinces in February 2023. The total natural gas consumption share of the three sectors with the highest consumption – residential, industrial and power plants – constituted 87 percent in 2023. Accordingly, their total share in 2023 remained the same as the five-year (2019-2023) average. Notably, the lack of overall growth notwithstanding, there remains an ongoing expansion of gas as a prime energy source in private households; 2023 saw the addition of roughly 1.1 million new natural gas subscribers. This is important as expanding household gas consumption is likely to increase the importance of natural gas both economically and politically. It also carries the seed for future demand growth.

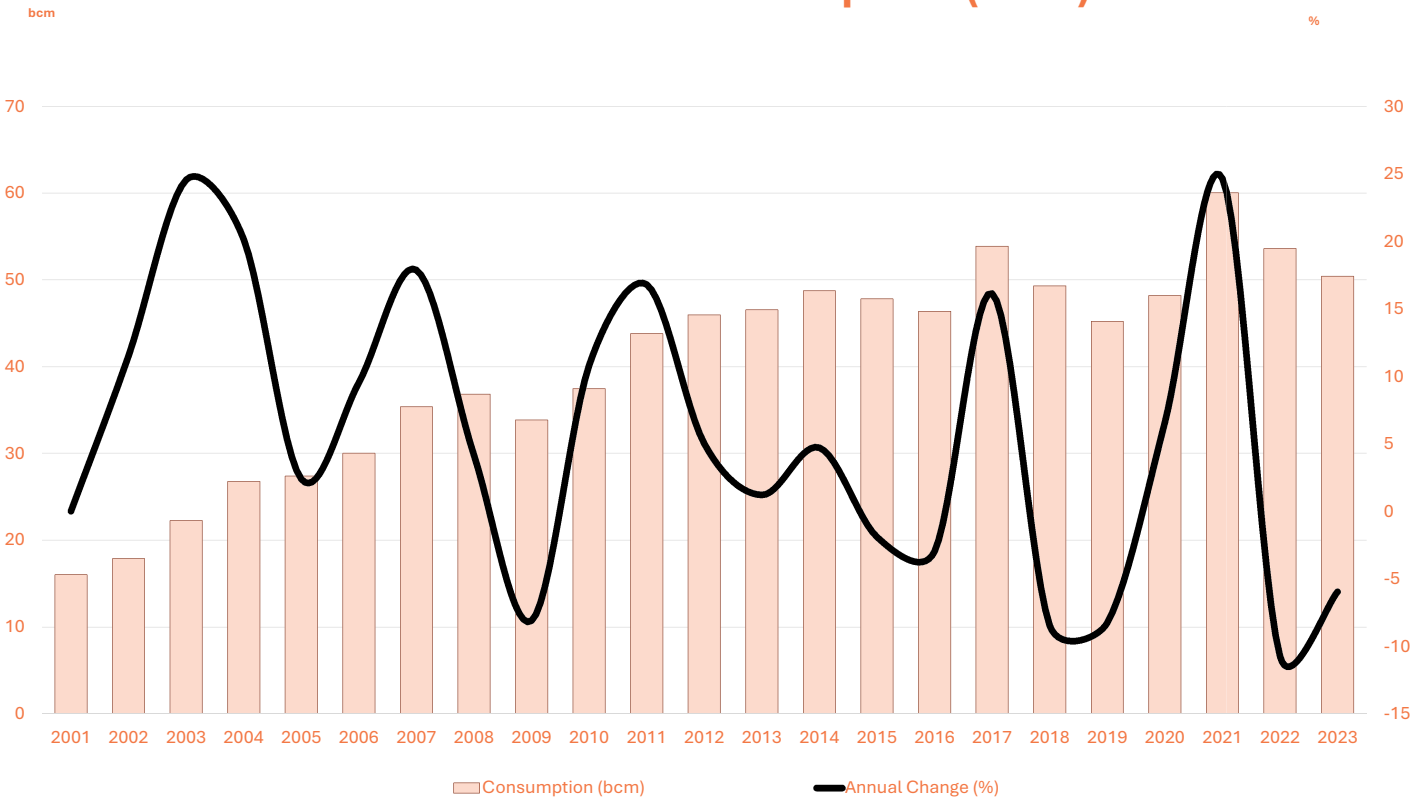
Export ambitions

With the backdrop of currently little (if any) growth in national gas demand alongside a budget deficit, Turkey is mulling LNG exports to Europe and is seeking the ability to re-export surplus gas from Russia and Azerbaijan to the

Turkish Pipeline Gas Imports (bcm) Caspian Region (Estimate)



Turkish Gas Consumption (bcm)



Source: GAZBİR

European market, Azernews reported, citing Yashar Arslan, President of GAZBİR. According to Arslan, a general amendment to Turkey’s national mining regulations in addition to new LNG-specific tweaks have ‘opened the way for Turkey to trade LNG with European countries’, especially in Eastern Europe. As reported by Interfax, he further highlighted in local media that ‘with the change in legislation, Turkey has set its sights on liquefying the natural gas it imports or produces from its own sources and exporting it.’

Apart from streamlining finder’s rights and enhancing revenue collection from licence holders, the new legislation aims to bolster the development of Turkey’s LNG market and the national goal of becoming a commercial hub for natural gas. It introduces the classification of liquefying natural gas as a distinct market activity, separate from LNG storage. A new licensing regime for exporting liquefied natural gas, either extracted or imported in Turkey, was also established. Additionally, the Turkish Energy Market Regulatory Authority will now be able to grant exceptions and exemptions to floating LNG facilities, which previously had solely operated under a storage license regime.

Notably, according to Sohbet Karbuz, Director of Hydrocarbons and Energy Security at the Mediterranean Organization for Energy and Climate speaking to state-run Turkish news agency Anadolu Agency, the new set of regulations allow for gas produced from

Turkey’s new Sakarya gas field in the Black Sea to be exported as LNG. He said they would also encompass future gas discoveries.

Sakarya gas field

A considerable part of the Turkish vision of a Mediterranean gas hub seems to rest on the Sakarya field, which is being developed in two phases. The first phase began in April 2023 and involves drilling ten wells to produce 3.5bcm annually. The second phase, planned for after 2027, will increase annual production to 14bcm by adding 30 wells connected to a subsea

production system. This phase will also involve installing a larger pipeline and enhancing onshore facilities. The Turkish government anticipates Sakarya to eventually meet around 30 percent of the country’s natural gas demand and thus significantly lessen the country’s current dependence on gas imports.

However, a recent analysis by Carnegie Europe highlighted the difficulty of accurately calculating the extent to which projections of future offshore gas production will come to fruition. In particular, the think tank emphasised that the timeline for the exploitation of

Sakarya’s gas reserves remains tentative whilst any future demand growth might outpace production increases.

As such, the true value of Sakarya and other finds may serve more as a bargaining chip during long-term natural gas contract negotiations with Russia and Iran.

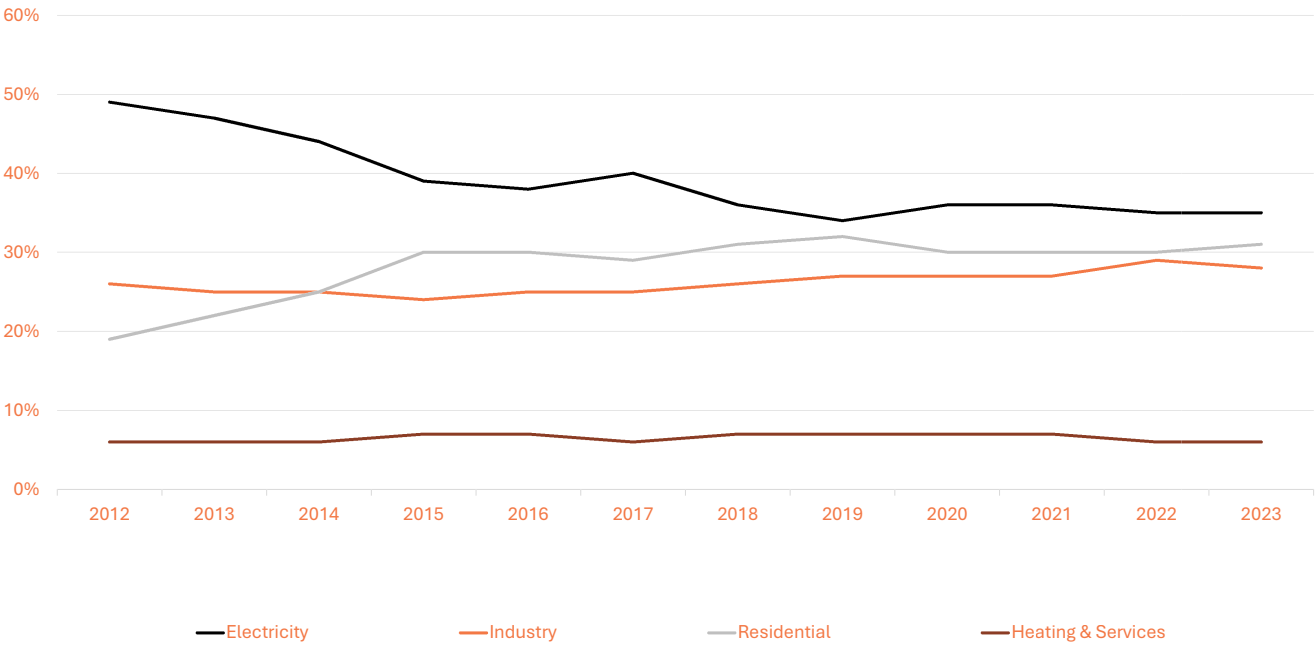
Current obstacles

Turkey has been on a quest of squeezing better terms from its long-term pipeline gas and LNG suppliers for several years. In 2020, Turkey’s then Deputy Energy Minister and former EMRA commissioner Alparslan Bayraktar advocated for the restructuring of the country’s domestic natural gas market by introducing some market liberalisations and long-needed ‘flexibility and competitiveness’. In a webinar hosted by the Atlantic Council in May that year, Bayraktar indicated that Turkey would be unwilling to accept similarly restrictive long-term contracts it had signed in the past and that all new contracts will be comparatively short in duration.

As we have highlighted previously, Turkey’s Energy Market Regulation Authority (EMRA) has been keen to implement fundamental changes to Turkey’s gas economy to increase security of energy supply and open it up to more competition since 2001, when it proposed its Natural Gas Market Law.

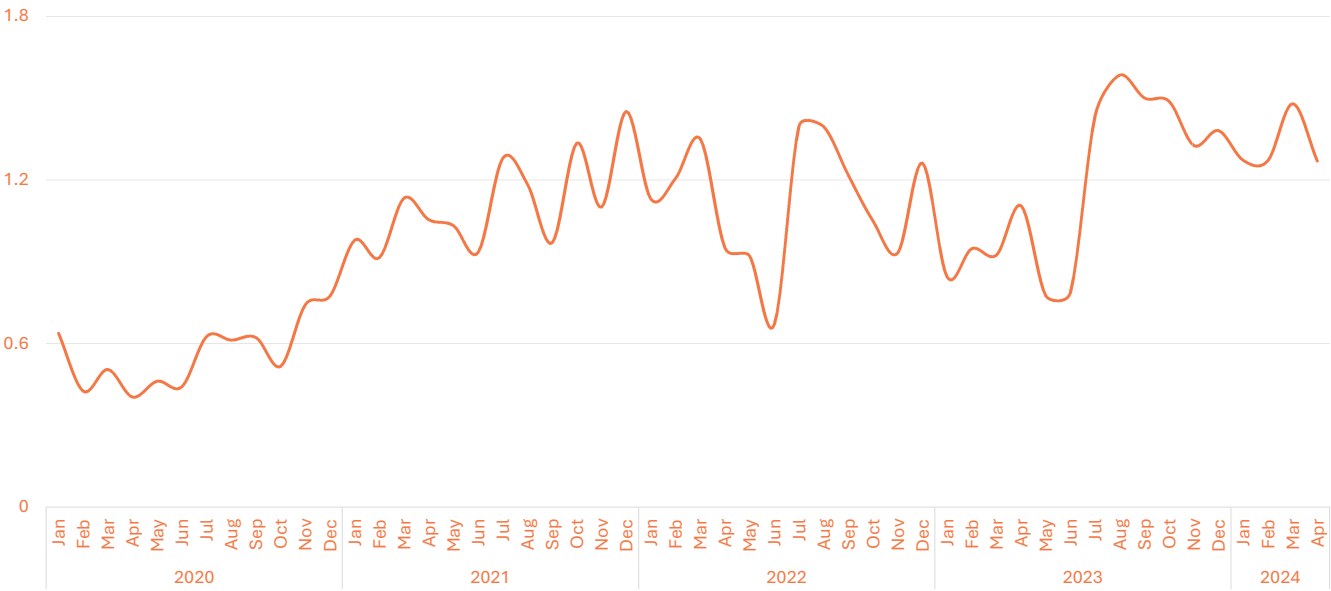
Moreover, Turkey’s efforts to diversify its natural gas supplies have in the past been constrained by its infrastructure networks. The majority of Turkey’s

Turkish Gas Consumption by Sector



Source: GAZBİR

EU Pipeline Gas Flows via Turkey (bcm)



Source: ENTSOG

natural gas comes from Russia, facilitated by two major pipelines: Blue Stream, operational since 2003, and TurkStream, launched in 2020. Additionally, Turkey is connected to Azerbaijan via the Baku–Tbilisi–Erzurum pipeline (since 2001) and to Iran through the Eastern Anatolian Natural Gas Main Transmission Line (since 2003), but their combined capacity is less than half of the Russian pipelines' total capacity. Natural gas trade through these pipelines is governed by long-term contracts that are difficult to modify in the short-term.

Due to limited flexibility in its existing infrastructure, Turkey's previous natural gas import diversification strategy has focused on developing facilities for processing, storing, and distributing pipeline gas and LNG. Historically, LNG was purchased under long-term supply agreements, but since 2021, a more flexible market for shorter-term deals has emerged. In this evolving landscape, LNG spot market imports accounted for 18 percent of Turkey's total imports in 2022. Additionally, Turkey has steadily increased its gas storage capacity, creating strategic reserves that could be utilised during peak consumption periods, thereby enhancing the flexibility and resilience of its natural gas system.

For Turkey to obtain a more active role in international LNG trade other than as a destination, it must aim to secure gas contracts that grant the freedom to re-export surplus volumes. Presumably, the changes to Turkey's LNG contract policy announced by Bayraktar already address 'final delivery point' clauses previously

found in Turkey's long-term LNG contracts. However, with significant gas contracts set to expire in the near future, including those through the Blue Stream pipeline and an Iranian contract, the issue of re-export rights for gas from those channels also calls to be considered. We highlight that pipeline owners such as Gazprom have historically shown to be set on retaining and exerting control over gas flows end-to-end. For example, the Russian gas conglomerate prominently lost cases against the EU over restrictions on destination, reverse gas flows between EU Member States and pipeline operatorship after it had attempted to impose such terms on EU buyers. Turkey may not have the same leverage when negotiating new terms – especially, as Arslan reportedly suggested, for excess pipeline gas to be liquefied and resold (although there might be thinkable scenarios where Turkey could serve as a new Mediterranean LNG converter at some point in the future).

Dedicated facilities?

The closest and most lucrative gas market in Turkey's vicinity is the EU, and thus Turkey's future as an LNG hub is likely to hinge on European demand. As we have reported in the past, Turkey has already sought to gain a foothold in the European LNG market via the Saros FSRU project. The facility is the country's third FSRU installation and the second operated by state-owned BOTAŞ, which also owns and operates the Iskenderun facility offshore Dortyol in southern Turkey. Independent player Pardus

Energy has stationed the 170,000m³ Turquoise offshore Etki, a small town close to Izmir.

Through the Saros FSRU, BOTAŞ has placed itself in a position to compete directly with Greek capacity to provide LNG access to Eastern Europe, at least for the duration of its charter of the Vasant 1. The commissioning of the FSRU at Saros took place almost a year ahead of the planned inauguration of the Alexandroupolis project.

The prize, at least in part, is access to the Bulgarian gas market and, by extension other European markets. Once admonished by the European Commission for lacking the political will to push ahead with EU plans for supply diversification, Bulgaria has been pushing ahead with interconnector expansion, offshore developments and establishing a long-term LNG import channel since 2019.

In line with the capacity expansion, Turkey's gas champion agreed with Bulgargaz access to Turkey's gas grid and LNG import facilities for 13 years. Bulgargaz is now planning to import up to 1.5bcm per year of regasified LNG via Turkey, according to the Bulgarian Council of Ministers. This is roughly equivalent to 1.10mtpa of LNG. In essence, the agreement allows Bulgargaz to book slots at Turkish regas terminals and import regasified LNG to Bulgaria via the Bulgarian-Turkish interconnector at Malkoclar. Apart from operating all but one of Turkey's FSRUs (as well as the Marmara Ereğlisi onshore terminal), BOTAŞ is also the country's transmission

systems operator (TSO).

However, the volumes the Saros FSRU could handle are dwarfed by the pipeline gas supply the EU already receives via Turkey from Russia and the Caspian Region. These imports amounted to 4.02bcm in 1Q 2024, up 1.31bcm (48 percent) year-on-year.

Export plant vision

Since the discovery of Sakarya, helped by the current trend of lower gas demand, the idea of building a gas liquefaction plant in Turkey to produce LNG from domestically produced volumes or surplus pipeline supply has gained some traction.

To facilitate this, some have advocated for establishing an LNG export facility, which would require financing and technology, both potentially benefitting from foreign investment and collaboration. 'If we succeed in establishing such a facility, we can sell the surplus gas we produce and export it to foreign markets when market conditions are favourable,' Karbuz explained. Karbuz added that such exports would likely take place on the spot market, with LNG cargoes going to the market offering the best price, whether in Asia or Europe. However, he cautioned that it is still unclear how much and when Black Sea gas can be exported.

The picture that emerges, then, is one that would caution against building a gas liquefaction plant with the aim to export LNG to European buyers. Not only would it likely be a costly undertaking both in terms of time and capital, by the time it would become operational – possibly post-2030 – European gas demand growth may well have peaked already in view of climate policies. Instead, as suggested by Tom Marzec-Manser, Head of Global Gas Analysis at ICIS quoted by Turkish newspaper Daily Sabah, Turkey would be better off sending excess piped gas to Europe at competitive rates marketed to various gas companies – provided this can be negotiated with its gas suppliers.

In our view, what remains as the most viable course of action is the re-routing or re-export of purchased LNG in times of low demand or limited storage capacity whilst retaining the freedom to re-sell LNG at times of high prices to generate cash. This has now become an option following May's amendments to Turkish mining legislation, and which Karbuz described as 'very important for paving the way for the private sector and establishing a more free, competitive, and liberal market mechanism.'



LNG infrastructure for harsh weather conditions

Crown LNG's vision is to enhance energy security & support a responsible green energy transition.



The Crown LNG value chain



To find out more visit www.crownlng.com

Preliminary data points to ongoing monthly trade decrease

Our May data showed another LNG trade decrease globally following a slump in April. Meanwhile, demand was weighed down by reductions in Europe, India and the Far East, our Market Editor Alexander Wilk reports.

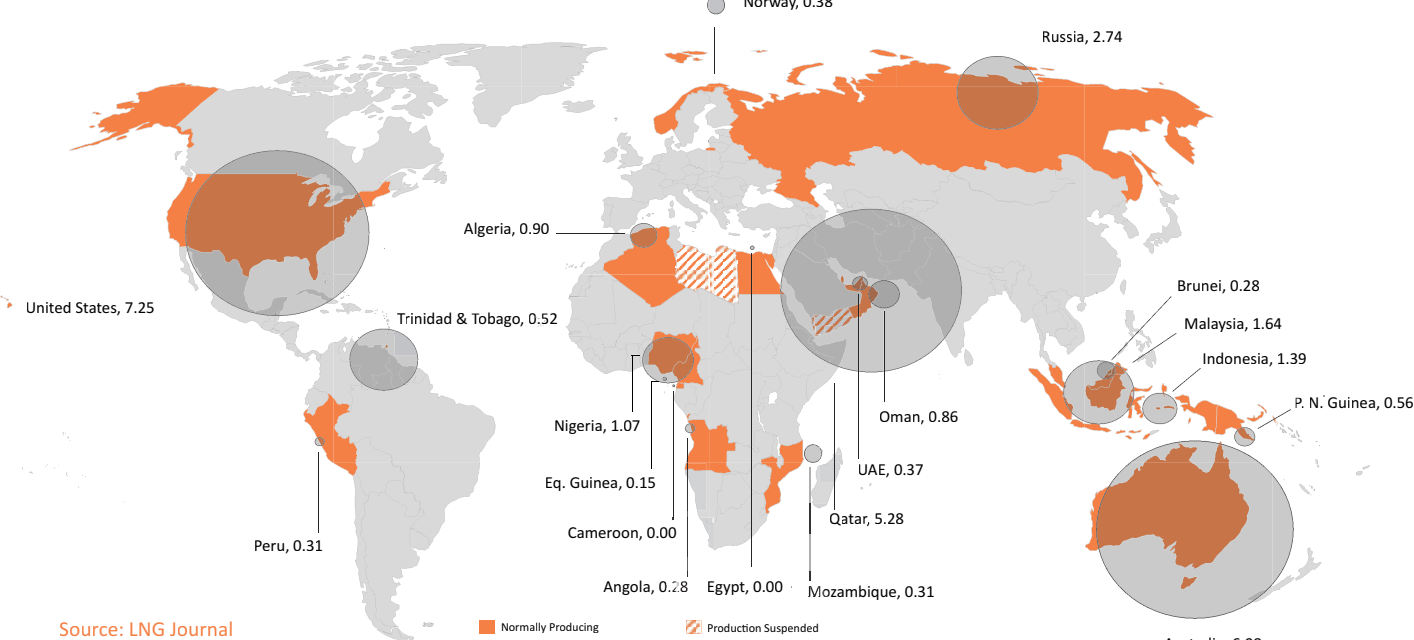
According to our preliminary data, global LNG exports as of 29 May amounted to 30.37mmt and were thus down by 2.45mmt (-7 percent) from the 32.82mmt we recorded on 29 April.

Among the three most significant exporters, Australia cut exports by 0.33mmt (-5 percent) to 6.08mmt from 6.41mmt in April. Concurrently, Qatar reduced shipments more drastically by 0.85mmt (-14 percent) to 5.28mmt in shipments from 6.13mmt in April, with Ras Laffan’s annualised capacity utilisation at 82 percent. Similarly, Malaysia’s LNG flows had plummeted by 0.75mmt (-31percent) to 1.64mmt from 2.39mmt.

These export reductions were cushioned, however, by an increase of 0.61mmt (9 percent) to 7.25mmt by exporters in the United States. Notably, Sabine Pass LNG, Freeport LNG and Cove Point LNG produced at or above annualised nameplate capacity.

As large-scale producers had continued to considerably reduce their output at the time of writing, smaller producers

Global LNG Exports (MMt)
1-29 May 2024



Source: LNG Journal

struggled to compensate, even when at times they showed significant month-on-month growth rates. Nevertheless, owed to their smaller capacities, net growth among exporters such as Russia, Mozambique and Peru represented little more than a single cargo whilst others

such as Indonesia had merely kept their shipped May volumes steady.

Global LNG demand, meanwhile, had decreased by 1.61mmt (-5 percent) month-on-month as of 29 May. Offtakes were still led by China with imports of 6.19mmt in May to date, although they were down by 0.39mmt (-6 percent) from 6.58mmt alongside a reduction of 0.39mmt (-8 percent) to 4.53mmt in Japan.

Concurrently, smaller Pacific buyers collectively had seen imports increase by only 0.28mmt (8 percent) to 3.56mmt at the time of writing. In Europe, strong negative demand growth mainly among northern European buyers overshadowed significant growth spots among southern European terminals. However, Middle Eastern demand continued with month-on-month growth, although, like in April, this was insufficient to offset the significant aforementioned reductions.

Export - Pacific Basin

At the time of writing, Pacific exports had accrued to 11.39mmt and thus came in below April’s equivalent total of 12.59mmt by 1.20mmt (-10 percent). Consequently, annualised capacity utilisation stood at 74 percent. Accordingly, exports were also down slightly by 0.50mmt (-4 percent) year-on-year.

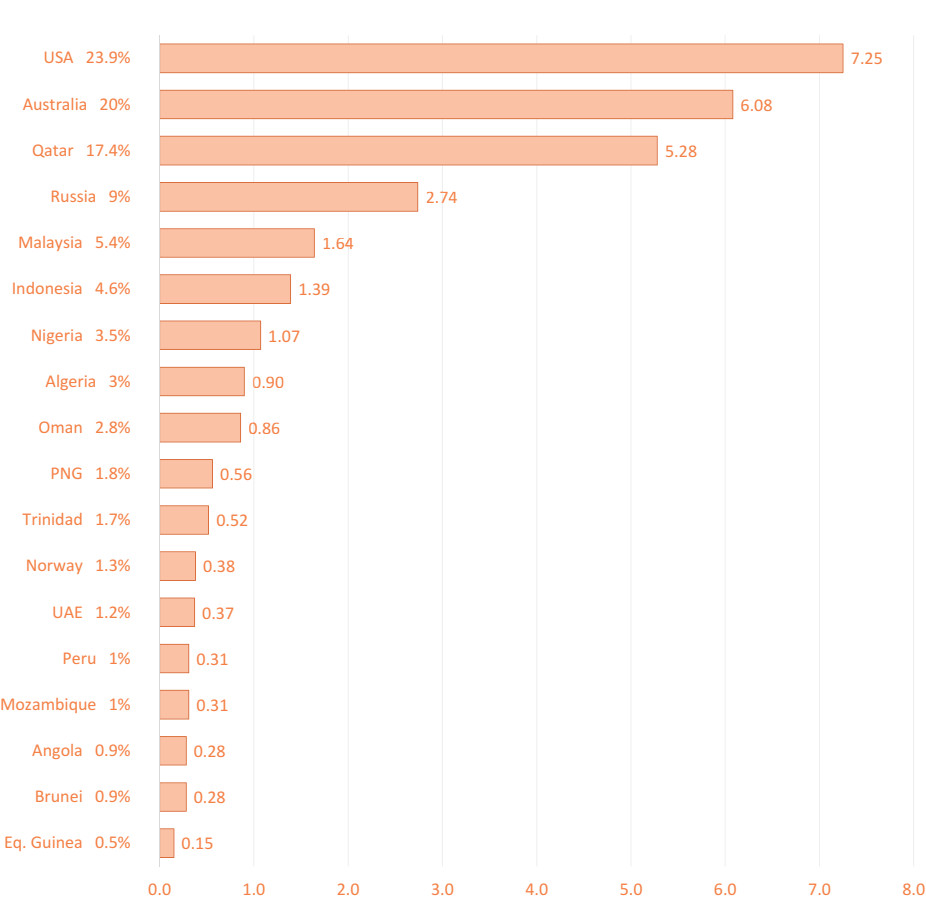
Australia: The Pacific Basin's most

significant exporter by installed capacity – Australia – ended the month to date with a significant decrease in shipments of 0.33mmt (-5 percent) to 6.08mmt from 6.41mmt in April.

Among the most significant month-on-month reductions, Gorgon LNG cut shipments by 0.30mmt (-23 percent) to 0.99mmt from 1.29mmt in April. Australia Pacific LNG also reduced output by 0.16mmt (-20 percent) to 0.63mmt alongside a 0.12mmt (-26 percent) export cut to 0.35mmt at Pluto LNG. Queensland Curtis LNG and Wheatstone LNG, meanwhile, had seen more moderate reductions at the time of writing, showing LNG flow decreases of 0.08mmt (-12 percent) to 0.60mmt and 0.02mmt (-2 percent) to 0.88mmt, respectively. These export reductions were only partially compensated by export increases totalling 0.35mmt at Gladstone LNG, Ichthys LNG, Prelude FLNG and NWS LNG. Gladstone LNG saw a significant increase of 0.17mmt (41 percent) to 0.58mmt whilst Ichthys LNG also achieved a substantial increase of 0.11mmt (16 percent) to 0.81mmt. The export increase at Prelude FLNG, meanwhile, was more moderate in volume terms at 0.05mmt (22 percent) to 0.28mmt whilst NWS LNG saw a slight increase of 0.02mmt (2 percent) to 0.96mmt.

Australian exports at the time of

Market Share & LNG Exports by Country (MMt)
1-29 May 2024

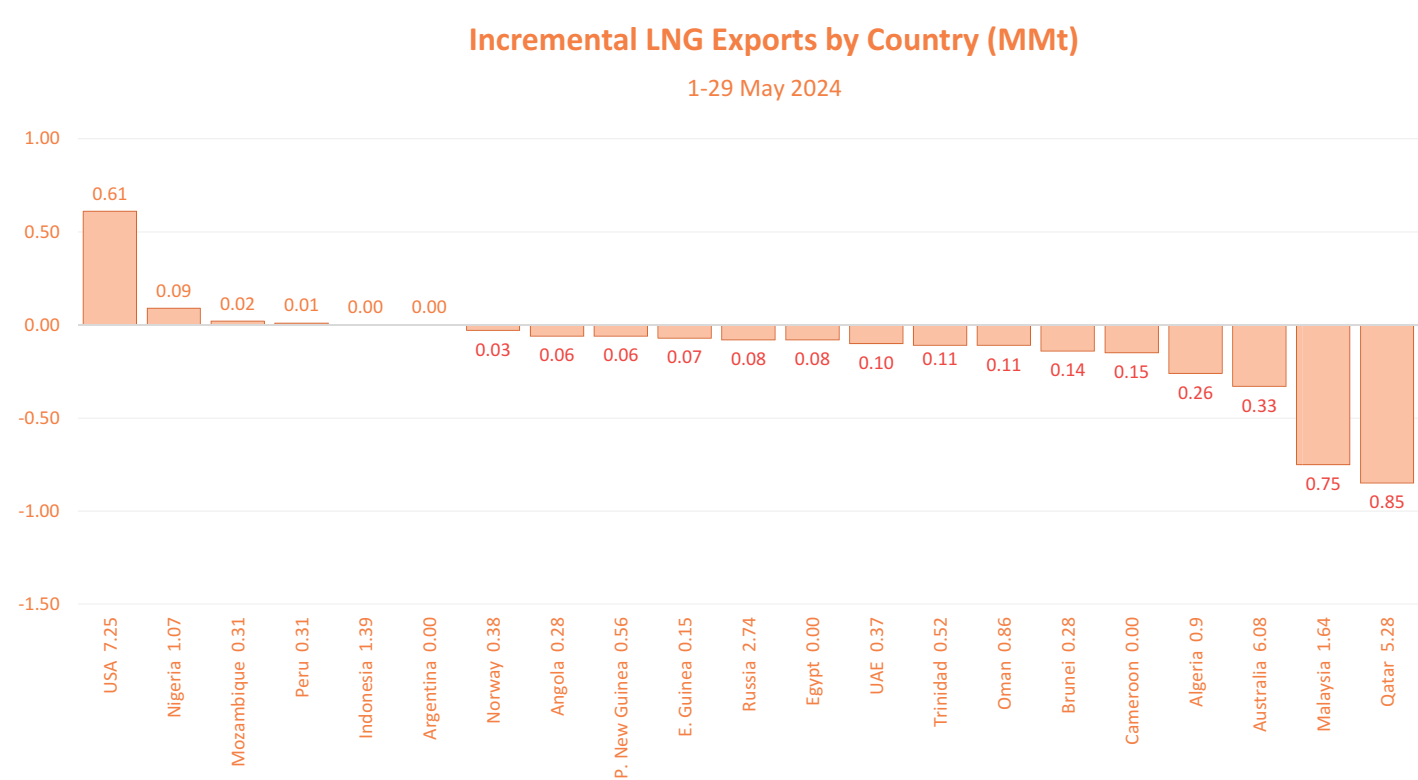


Source: LNG Journal

writing had been led by shipments to China amounting to 2.40mmt, followed by Japan with 1.41mmt. South Korea was the third most significant destination for Australian LNG in the month to date with 0.87mmt. Notably, we were also tracking 0.51mmt of Australian exports that were headed to still undisclosed destinations within the Pacific Basin.

Southeast Asia: North of Australia, our data for PNG LNG showed a preliminary export decrease of 0.06mmt (-10 percent) to 0.56mmt from 0.62mmt in April. The plant's annualised capacity utilisation rate thus stood at 81 percent. PNG exports were led by shipments to Japan amounting to 0.27mmt, which were up by 0.06mmt (29 percent) month-on-month. Taiwan also imported 0.07mmt from PNG LNG, following no such offtakes in April. China, however, had decreased imports drastically by 0.18mmt (-69 percent) to just 0.08mmt. Meanwhile, South Korea's offtakes from Papua New Guinea at the time of writing were also down by 0.08mmt (-53 percent) to 0.07mmt whilst a 0.07mmt cargo still had to declare its destination within the Pacific at the time of writing.

Indonesia, meanwhile, had maintained exports for the month to date at 1.39mmt compared to their April equivalent. Tangguh saw a slight increase of 0.02mmt (2 percent) to 0.90mmt alongside an increase of 0.01mmt (6 percent) to 0.18mmt at Donggi-Senoro LNG. This growth was only tempered by a 0.03mmt (-9 percent) reduction to 0.31mmt at Bontang LNG. Consequently, the Tangguh and Donggi-Senoro plants produced at 95 and 105 percent of



Source: LNG Journal

annualised capacity utilisation, respectively, whilst Bontang produced at 32 percent.

Malaysia, meanwhile, had seen shipments slump by 0.75mmt (-31 percent) to 1.64mmt at the time of writing from 2.39mmt in April. Whilst PFLNG 2 had maintained output at 0.14mmt, PFLNG 1 saw a significant export decrease of 0.06mmt (-46 percent) to 0.07mmt, pegging its annualised nameplate capacity utilisation at 70 percent. Notably, the facility produced at roughly twice its nameplate capacity in April. Moreover, Malaysia LNG saw an export decrease of 0.69mmt (-33 percent) to 1.43mmt with only 59 percent of annualised capacity utilisation.

Brunei LNG recorded a significant

preliminary production decrease of 0.14mmt (-33 percent) to 0.28mmt at the time of writing, down from 0.42mmt month-on-month. The plant's annualised capacity utilisation rate thus stood at 47 percent. The plant had slashed its shipments to Japan, South Korea and Taiwan by 0.21mmt overall to just 0.14mmt, which was only partially compensated by an isolated export of 0.07mmt to Thailand as China merely kept its Brunei offtake steady at 0.07mmt.

Russia, Peru & Mozambique: Elsewhere in the Pacific, our data indicated Sakhalin-2 LNG saw an export increase of 0.05mmt (6 percent) to 0.82mmt in the month to date from 0.77mmt in April. The plant's annualised

capacity utilisation rate thus stood at 103 percent. LNG exports were led by shipments to Japan amounting to 0.46mmt, which represented a boost to that specific LNG flow by 0.16mmt (53 percent). Flows to South Korea and China, meanwhile, were down by 0.11mmt net.

Concurrently, Peru's Pampa Melchorita LNG had increased its monthly exports slightly by 0.01mmt (3 percent) to 0.31mmt. The plant's annualised capacity utilisation rate thus stood at 84 percent. LNG exports from Peru were led by 0.15mmt in shipments to Taiwan.

Finally, Mozambique's Coral Sul FLNG had recorded a production increase of 0.02mmt (7 percent) to 0.31mmt for the month at the time of writing, which pegged the plant's annualised capacity utilisation rate at 109 percent.

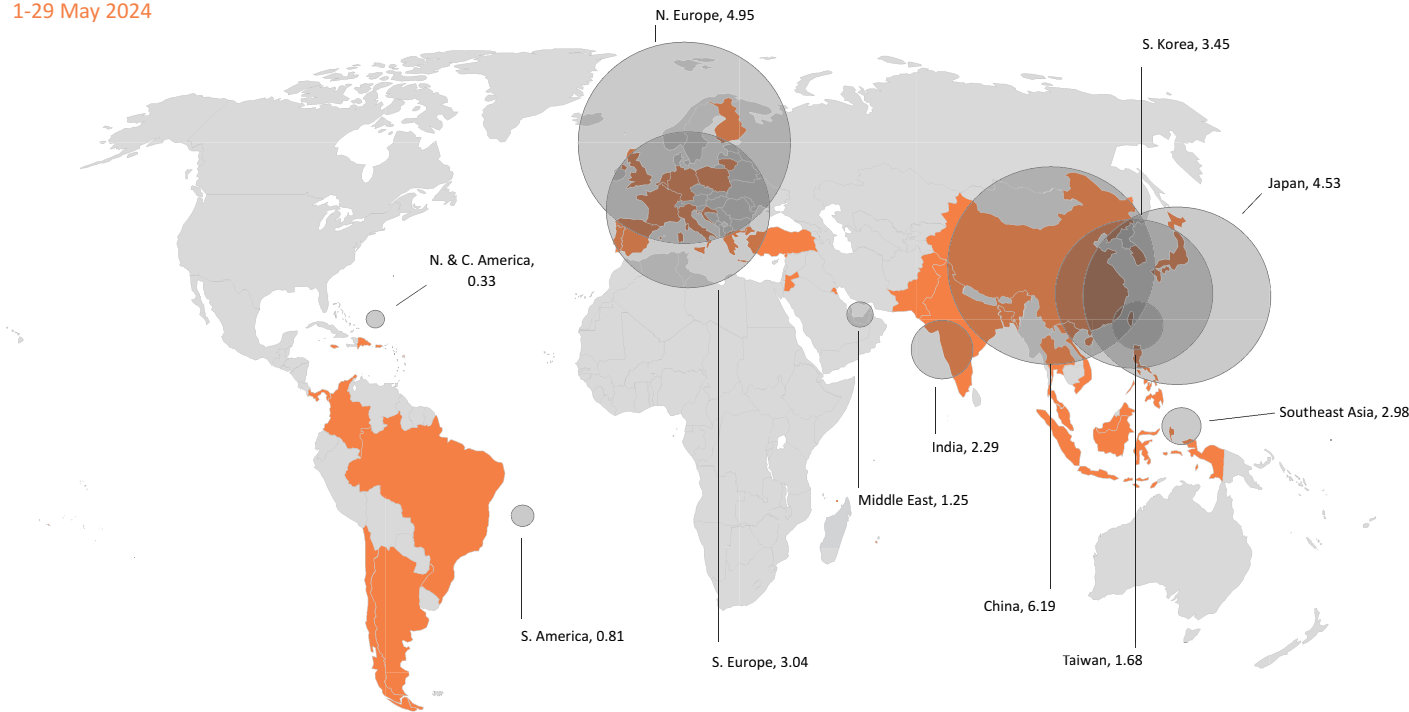
Atlantic Basin

Whilst also seeing negative growth, the Atlantic Basin's overall shipped LNG volumes had decreased only moderately by 0.11mmt (-1 percent) to 12.47mmt at the time of writing from 12.58mmt in April. This translated into annualised export capacity utilisation of 71 percent for the Basin. Exports were thus also down marginally by 0.08mmt (-1 percent) year-on-year.

North Africa & Europe: The amount of LNG shipped from within its north-eastern part – comprising the EEA, Russia and North Africa (and not including re-exports) – amounted to 4.70mmt for the month to date and thus saw a reduction of 0.61mmt (-11 percent)

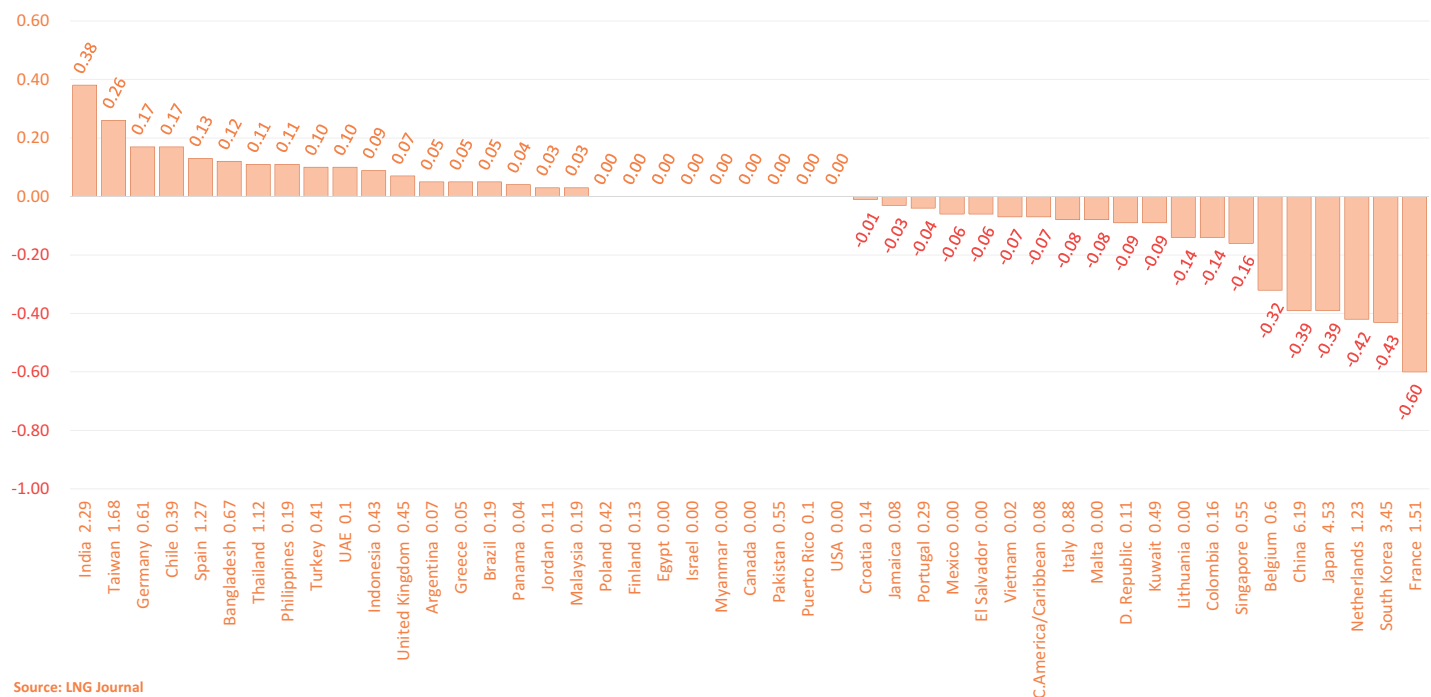
Global LNG Imports (MMt)

1-29 May 2024



Source: LNG Journal

Incremental LNG Imports by Country (MMt)
1-29 May 2024



Source: LNG Journal

from 5.31mmt in April.

The regional decrease was mainly due to an Algerian export cut by 0.26mmt (-22 percent) to 0.90mmt from 1.16mmt in April. Arzew curtailed shipments by 0.18mmt (-21 percent) to 0.68mmt whilst Skikda decreased its cargo loadings by 0.08mmt (-27 percent) to 0.22mmt. The two plants had thus operated at 39 and 34 percent of annualised capacity utilisation, respectively, our data showed at the time of writing.

Our data also showed Norway's Snohvit LNG saw a relatively modest production decrease in volume terms of 0.03mmt (-7 percent) to 0.38mmt at the time of writing. The plant's annualised capacity utilisation rate nevertheless still stood at 109 percent. Norway's LNG exports in the month to date had been supported by higher northern European demand but ultimately weighed down by the lack of shipments to Spain, Lithuania and Jordan that had boosted its exports in April.

Russia's Atlantic Basin capacity, meanwhile, also saw a shipment decrease by 0.13mmt (-6 percent) to 1.92mmt from 2.05mmt this time in April. Whilst Portovaya LNG cut exports moderately in volumes terms by 0.01mmt (-7 percent) to 0.13mmt, Yamal LNG decreased flows by 0.12mmt (-6 percent) to 1.79mmt from 1.91mmt. However, the plant continued to produce well above nameplate capacity at 123 percent whilst Portovaya's annualised capacity utilisation stood at 78 percent at the time of writing.

West Africa: West African LNG flows had also decreased and were down by 0.19mmt (-11 percent) to 1.50mmt from

1.69mmt in April.

Our data for Angola LNG showed the plant saw a decrease of 0.06mmt (-18 percent) to 0.28mmt from 0.34mmt in April. EG LNG had also slashed flows by 0.07mmt (-32 percent) to 0.15mmt from 0.22mmt whilst Cameroon FLNG had not yet been seen in the market following shipments amounting to 0.15mmt this time in April. These export reductions were only cushioned by an export increase of 0.09mmt (9 percent) at Bonny Island LNG with 1.07mmt in shipments compared to 0.98mmt this time in April. West African exports for the month to date were led by shipments to India amounting to 0.33mmt, followed by 0.18mmt going to Spain. Concurrently, however, shipments to the Far East and the Middle East suffered by offtake reductions in South Korea, China and Kuwait.

Americas: Our US LNG export data as of 29 May showed a bump in shipments by 0.61mmt (9 percent) to 7.25mmt from 6.64mmt in April. According to our data at the time of writing, the most drastic change stemmed from Freeport LNG, which had boosted its exports by 0.79mmt (172 percent) month-on-month to 1.25mmt from 0.46mmt in April. Calcasieu Pass LNG also increased exports by 0.25mmt (49 percent) to 0.76mmt whilst Sabine Pass LNG saw a more moderate month-on-month export increase of 0.07mmt (3 percent) to 2.59mmt. However, Cameron LNG had slashed exports by 0.35mmt (-26 percent) to 1.02mmt. In addition to this significant export curb, we recorded more moderate reductions totalling 0.15mmt at Corpus Christi LNG, Elba Island LNG and Cove

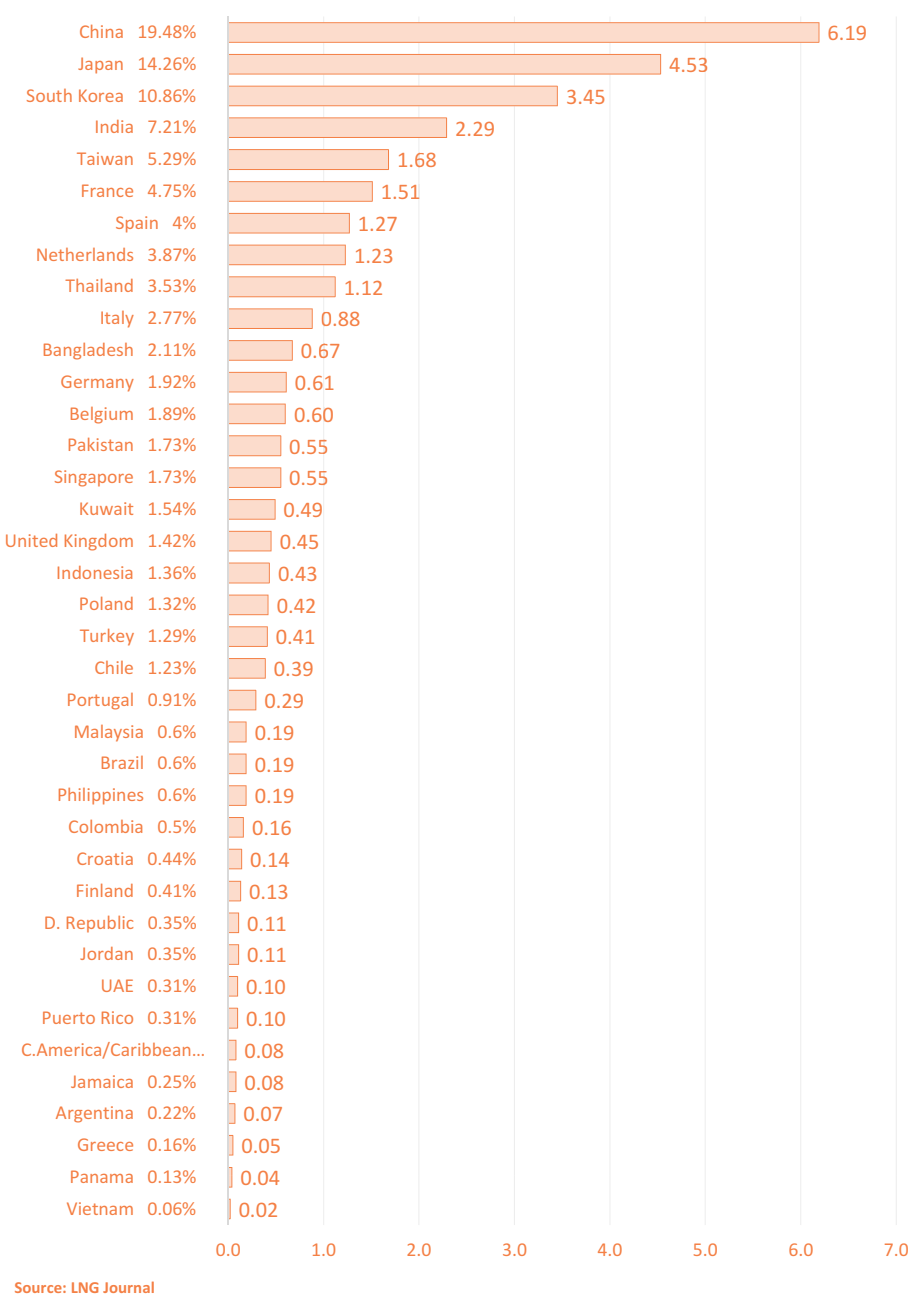
curtailed its month-on-month LNG exports by 0.11mmt (-17 percent), according to our data, with shipments amounting to 0.52mm. The plant's utilisation rate thus stood at 41 percent.

Middle East

Middle Eastern LNG exports at the time of writing in April amounted to 6.51mmt and thus showed a significant decrease of 1.14mmt (-15 percent) from 7.65mmt in April. Exports were also down by 0.61mmt (-9 percent) year-on-year. Our data thus showed the Basin's annualised utilisation of operational export capacity (i.e., excluding Yemen) at only 84 percent at the time of writing.

The Middle East's export cut was driven by Qatar's Ras Laffan LNG complex. Our month-to-date data indicated the facility had exported 5.28mmt in May, a decrease of 0.85mmt (-14 percent) from 6.13mmt in April. Accordingly, the plant's annualised capacity utilisation rate only stood at 82 percent. With European demand subdued,

Market Share & LNG Imports by Country (MMt)
1-29 May 2024



Source: LNG Journal

the necessity to avoid the Suez Canal in favour of the Cape Route, which previously has had a trade reducing effect with Europe, continued to only play a minor role in May. Instead, it was the slump in Qatari exports to the Far East and India that weighed heaviest on monthly trade. This reduction came in addition to less demand in the Middle East. However, we highlight that 0.29mmt of Qatari LNG still had to declare its destinations at the time of writing.

Meanwhile, an export decrease of 0.11mmt (-11 percent) to 0.86mmt in Oman was compounded by a reduction of 0.10mmt (-21 percent) at the UAE's Das Island plant. This meant annualised capacity utilisation at Das Island stood at 81 percent whilst at Oman LNG that figure stood at 99 percent.

Concurrently, Egypt had not yet made an appearance in the market in May, according to our data at the time of writing. The country had shipped a 0.08mmt cargo this time in April.

Imports & Domestic Trade

Global LNG imports at the time of writing had decreased significantly by 1.61mmt (-5 percent) to 31.77mmt from the 33.38mmt we recorded this time in April. Demand growth at the time of writing was elusive in both the Pacific and Atlantic Basins, which meant that relatively modest Middle Eastern growth could not compensate.

Pacific Basin

Month-on-month Pacific Basin imports were down by 0.29mmt (-1 percent) net to 21.70mmt from 21.99mmt in April. The roster of larger-scale importers consisting of China, India, Taiwan, South Korea and Japan collectively decreased their offtakes by 0.57mmt (-3 percent) in total to 18.14mmt from 18.71mmt this time in April.

Concurrently, the roster of smaller Pacific buyers – including Thailand, Bangladesh, Singapore, Malaysia, Indonesia, the Philippines, Chile and Vietnam – collectively had seen imports increase by 0.28mmt (8 percent) to 3.56mmt at the time of writing. This increase was primarily due to demand growth in Chile and Bangladesh, where offtakes were up by 0.17mmt (77 percent) and by 0.12mmt (22 percent) to 0.39mmt and 0.67mmt, respectively. Thailand, the Philippines, Indonesia and Malaysia also saw imports go up by a total of 0.34mmt month-on-month, our data showed at the time of writing. The roster's

overall growth was thus only tempered by demand reductions totalling 0.35mmt in El Salvador, Mexico, Vietnam and Singapore, whereby El Salvador and Mexico had not yet been seen in the market at the time of writing following imports totalling 0.12mmt in April.

Atlantic Basin

LNG demand in the Atlantic Basin had decreased faster than in the Pacific. Offtakes were down by 1.36mmt (-13 percent) to 8.82mmt, with annualised utilisation of installed capacity at 32 percent.

European demand saw a net decrease of 1.17mmt (-13 percent) to 7.99mmt. Strong negative import growth in France by 0.60mmt (-28 percent) to 1.51mmt

exacerbated decreases totalling 1.09mmt elsewhere in Europe, mainly the Netherlands, Belgium, Lithuania and Malta. As such, these decreases overshadowed growth of 0.52mmt stemming mainly from southern European buyers such as Turkey and Spain.

Our preliminary May data also showed a significant demand decrease of 0.19mmt (-19 percent) in the Americas. Notably, Jamaica, the US Virgin Islands' OPT LNG Hub, the Dominican Republic and Colombia curtailed offtakes by a total of 0.33mmt. As such, this could not be compensated by demand growth totalling 0.14mmt stemming from Argentina, Brazil and Panama. Puerto Rico had maintained its month-to-date

imports at 0.10mmt compared to April.

Middle East

Meanwhile, overall Middle Eastern LNG demand of 1.25mmt at the time of writing was up by 0.04mmt (3 percent) from 1.21mmt in April. Our data for the UAE showed a significant offtake increase to 0.10mmt following no offtakes in April whilst Jordan's Aqaba terminal increased imports by 0.03mmt (38 percent) to 0.11mmt. This growth was thus only tempered by a demand reduction of 0.09mmt (-16 percent) to 0.49mmt in Kuwait whilst Pakistan had maintained imports at 0.55mmt. As such, the Middle East's annualised import capacity utilisation stood at 23 percent at the time of writing. ■



First 'Changheng' series LNGC delivered

On 15th May, the world's first fifth-generation 'Changheng' series of 174,000 cu m LNGCs, 'Greenery Ocean', was named and delivered five months ahead of schedule. Technical Editor Ian Cochran reports.

She was built on the back of a long term charter to CNOOC Gas & Power Singapore Trading & Marketing, a wholly-owned subsidiary of China National Offshore Oil Corp (CNOOC), by Hudong-Zhonghua Shipbuilding (Group).

'Greenenergy Ocean' is first of six newbuilding LNGCs for CNOOC charter, following the signing of a contract in January, 2022.

She is jointly owned by MOL, CNOOC, and COSCO SHIPPING LNG Investment (Shanghai) and will be managed by MOL LNG Ship Management Pte Ltd.

Following her delivery at the end of May, the vessel will transport LNG procured by the CNOOC Group worldwide, mainly to China.

The remaining five vessels are

scheduled to be delivered between 2024 and 2026.

This series, independently developed, designed and built by Hudong-Zhonghua, a subsidiary of China State Shipbuilding Corp (CSSC), represents the highest technical level in the field of large LNGCs in the world today, the shipyard claimed.

In December 2021, Hudong-Zhonghua's 'Changheng' design obtained General Design Approval (GDA) and Pre-Contract Approval (PCA) from four IACS classification societies.

The LNGC has a total length of 299 m, a moulded width of 46.4 m, a moulded depth of 26.25 m and is classed jointly by ABS and CCS.

She combines the latest design concepts, the best technical equipment,

the strongest environmental protection performance, and is the most forward-looking of the first four generations of LNGC designs from Hudong-Zhonghua, the company said.

For propulsion, 'Greenery Ocean' is fitted with a WinGD 5X72DF2.1 dual-fuel main engine built by CSSC under license. The engine comes equipped with latest intelligent controlled exhaust gas recirculation (iCER) system technology.

The ship was also built utilising Hudong-Zhonghua's fourth generation double stern fin line, which achieves the best match between reducing the self-propelled resistance and improving the stern propulsion efficiency, according to the designer.

With the aid of multiple test runs in a European test tank, the design can achieve excellent navigation efficiency at medium and high speed operations.

Compared with the previous generation of ships, the daily carbon emissions are reduced by more than 10 tonnes.

When designing this type of ship, full consideration was given to compatibility and flexibility. It is not only fitted with GTT's NO96 series containment system, but also the MARK III series from the same stable.

Lower BOG

By using the No96 containment system, the boil-off (BOG) rate is claimed to be 15% lower at 0.085% than that of the previous generation L03+ system,

providing a broader speed range of oil/gas balance for low-carbon propulsion.

The vessels will be able to call at 120 LNG terminals worldwide, showing excellent global flexibility.

'Greenery Ocean' represents the first ship of the largest LNGC construction project in China thus far - the 'LNG Carrier Project for CNOOC's Medium and Long-Term FOB Resources Matching'.

The delivery of this ship is of great significance towards ensuring the safety of China's energy transport, effectively improving the independent control of China's LNG transport industry chain, and helps China build a powerful manufacturing and shipping industry, it was claimed.

"The technical performance of the 'Greenery Ocean' LNG carrier has reached the world's leading level. Compared with the previous generation, the hull weight has been reduced by over 1,500 tonnes, leading to lower fuel consumption. It can reduce carbon emissions by over 10 tonnes per day and accommodate an additional 800 cu m of LNG per voyage," said Weng Hongbing, General Manager of Hudong-Zhonghua Shipbuilding, reported Chinese media. ■

Footnote: This article was taken from a social media post by Quin Xu Director, Sales & Marketing, Business Development - Global Marine & Offshore Director, Sales & Marketing, Business Development - Global Marine & Offshore at Ridge Consulting (Shanghai) Co, Ltd, the MOL website and various other information portals.



The first 'Changheng' type LNGC 'Greenery Ocean'

KR addresses cryogenic insulation materials

The Korean Register of Shipping (KR) has published a research report entitled 'Guide to Selection of Thermal Properties for Cryogenic Insulation Materials'.

This was published to ensure the safe storage of cryogenic cargoes (LNG or liquefied hydrogen) on ships, the class society explained.

Last year, the IMO adopted the 2023 IMO Strategy on Reduction of GHG Emissions from Ships with the goal of achieving international maritime carbon neutrality by 2050 in stages.

The strategy aims to reduce greenhouse gas emissions by at least 20%, aiming at 30%, by 2030, by at least 70%, aiming for 80%, by 2040, compared to

2008 and achieving net-zero emissions close to 2050.

In response to these strengthened environmental regulations, the maritime industry is focusing not only on LNG, which is currently widely used, but also on alternative fuels such as hydrogen and ammonia for long-term use.

Particular attention is being paid to insulation system technologies for the safe and efficient transportation and storage of cryogenic fuels.

The cryogenic fuels are LNG and

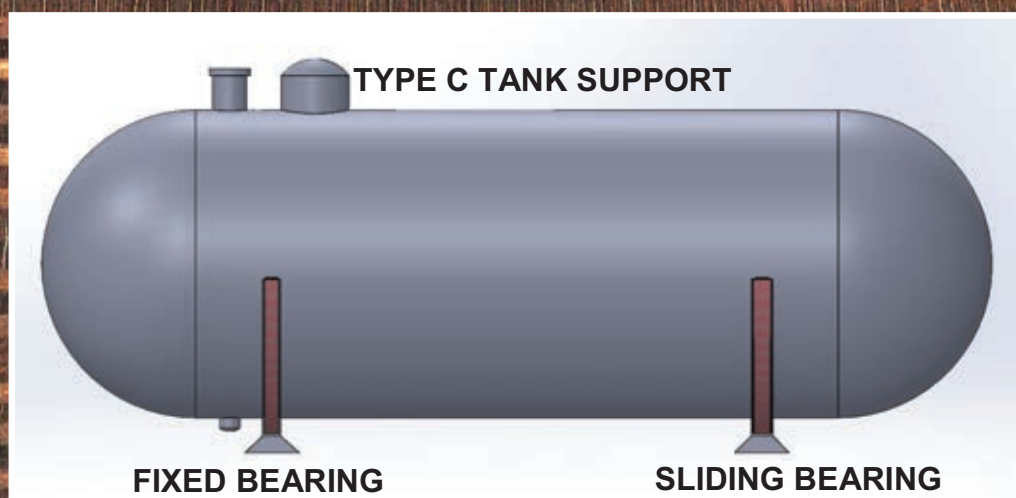
liquefied hydrogen. The liquefaction temperature of hydrogen is -253 deg C, which is about 90 deg C lower than LNG, requiring advanced insulation technologies. Liquefied hydrogen reduces its volume by about 800 times compared to its gaseous state.

KR, in collaboration with the Korea Institute of Machinery and Materials, Pusan National University, and Seoul National University of Science and Technology, has published the guide to propose essential insulation system

technologies for the cryogenic fuels.

The report explained the insulation systems for LNG at -163 deg C and for liquefied hydrogen at -253 deg C applied to ships, as well as analysing the environmental factors affecting their designs, such as heat transfer mechanisms.

It is expected to serve as a technical guide in the material selection stage when designing insulation systems for cryogenic environments or developing innovative insulation systems, KR said. ■



DEHONIT® / PERMALI TANK SUPPORTS

- ◆ FOR IMO A, B, C, BILOBE AND TRILOBE TANKS
- ◆ FOR MEMBRANE TANKS
- ◆ FOR VERTICAL IMO TYPE C TANKS

WITH CARGO/ FUEL TYPE

- ◆ LNG, LPG, LH₂, LEG, LCO₂, LNH₃

DEHONIT® / PERMALI MATERIAL IS APPROVED BY

- ◆ DNV (DET NORSKE VERITAS)
- ◆ BV (BUREAU VERITAS)
- ◆ ABS (AMERICAN B. OF SHIPPING)
- ◆ LR (LLOYD'S REGISTER)
- ◆ CLASS NK
- ◆ CCS (CHINA CLASS. SOCIETY)
- ◆ KR (KOREAN REGISTER)
- ◆ GTT
- ◆ DIN ISO 9001:2015

FEATURES OF DEHONIT® / PERMALI

- ◆ MORE THAN 70 YEARS IN SERVICE
- ◆ LOW SPECIFIC WEIGHT
- ◆ HIGH COMPRESSIVE STRENGTH
- ◆ WATER RESISTANT
- ◆ LOW THERMAL CONDUCTIVITY
- ◆ LOW COEFFICIENT OF FRICTION
- ◆ TEMPERATURE STABILITY
- ◆ LOW COEFFICIENT OF LINEAR EXPANSION

Port Canaveral prioritizes LNG fuelling in expansion plans

As demand for LNG as a maritime fuel continues to grow, the need to continually adapt capabilities can add operational drag for organisations but some ports are proactively navigating these challenges by coordinating simultaneous investment in infrastructure, training, and technology. Fuelling Editor Malcolm Ramsay has more.

Port Canaveral in Florida has been a pioneer in LNG through the cruise sector and has embraced an integrated approach to investment for some time, with its latest development aiming to expand LNG capacity even further. In May the port authority announced plans to build a new multi-user cruise terminal at the Port's existing North 8 berth.

"A new cruise terminal and the business it will deliver builds on our Board's commitment to the economic prosperity of our Port community," Micah Loyd, Chairman of the Canaveral Port Authority Board of Commissioners, notes. "This proactive, business-oriented strategy reaffirms our commitment to ensure the State of Florida continues to prosper from cruise tourism and remains the 'Cruise Capital of the World'."

Operational support

LNG is at the centre of this planned development as the port and is part of an evolution in fuelling since it first began preparations for LNG in 2016 and launched commercial operations for LNG as a maritime fuel in 2021.

"Our role is centred on operational support for fuelling LNG-powered vessels," Cory Dibble Director at Port Canaveral, tells LNG Journal. "Port Canaveral holds the distinction of being North America's pioneering port for LNG fuelling of cruise vessels. By the close of 2024, we will have four homeported ships fuelled by LNG."

These four LNG-fuelled vessels include the *Carnival Mardi Gras*, which arrived



Site of the proposed terminal

in July 2021, the *Disney Wish* which arrived in June 2023, the *Royal Caribbean International Utopia of the Seas* which will arrive in July 2024, and finally the *Disney Treasure* which is scheduled to arrive in December 2024.

The proposed multi-user cruise terminal is expected to drive significant cost savings, operational flexibility, and will be built under an expedited construction timeline of approximately two years.

"We have cruise partners with immediate needs to locate assets in Florida and Port Canaveral is where they want to be," Capt. John Murray, Port Canaveral CEO, explains. "Our ability to efficiently bring a new cruise terminal online was key to retaining and growing

this important business segment that supports many jobs and delivers high value to our regional and state economy."

Workforce investment

The new terminal at North 8 berth will share its basin with the Port's Cruise Terminal 5 on the northside of Port Canaveral. Designed and constructed in 2018 for multi-purpose use, the new site will require minimal modifications to extend its current bulkhead from 1,020 to 1,344 linear feet. The site will then be able to accommodate larger cruise vessels, further enhancing its operational capabilities.

A target completion date is currently set for the summer 2026, with the design, engineering, and construction still under discussion. The new terminal campus is also expected to feature a multi-story parking facility with a capacity for up to 3,000 vehicles, as well as roadway improvements, including the addition of turning lanes and a 'flyover' ramp, which will directly connect the site with State Road 401.

"We continue to invest in our operations capabilities and work closely with our Port partners to ensure our capacity to handle increased demands," Dibble adds, "With the guidelines and procedures we've developed, along with our several years of operational experience with LNG vessel fuelling, Port Canaveral has well demonstrated the safety and

efficiency of LNG bunkering operations."

HAZID training

This commitment to safety and training around LNG operations is fundamental at the port and before any operation involving LNG, be it cruise or cargo-related, every party involved must undergo a Hazard Identification (HAZID) process which must include personnel from Port Canaveral, US Coast Guard, Canaveral Pilots, Canaveral Fire Rescue, the fuel provider and bunker service operator, as well as personnel representing the receiving vessel.

"An approval to operate hinges on preparing and sharing plans with the Port that have been approved by the USCG and Canaveral Fire Rescue," Dibble explains. "These meticulous steps ensure that all involved parties have thoroughly reviewed the operational plans and that the details meet the Port's established safety and operational requirements, thus maintaining Port Canaveral's stellar safety track record."

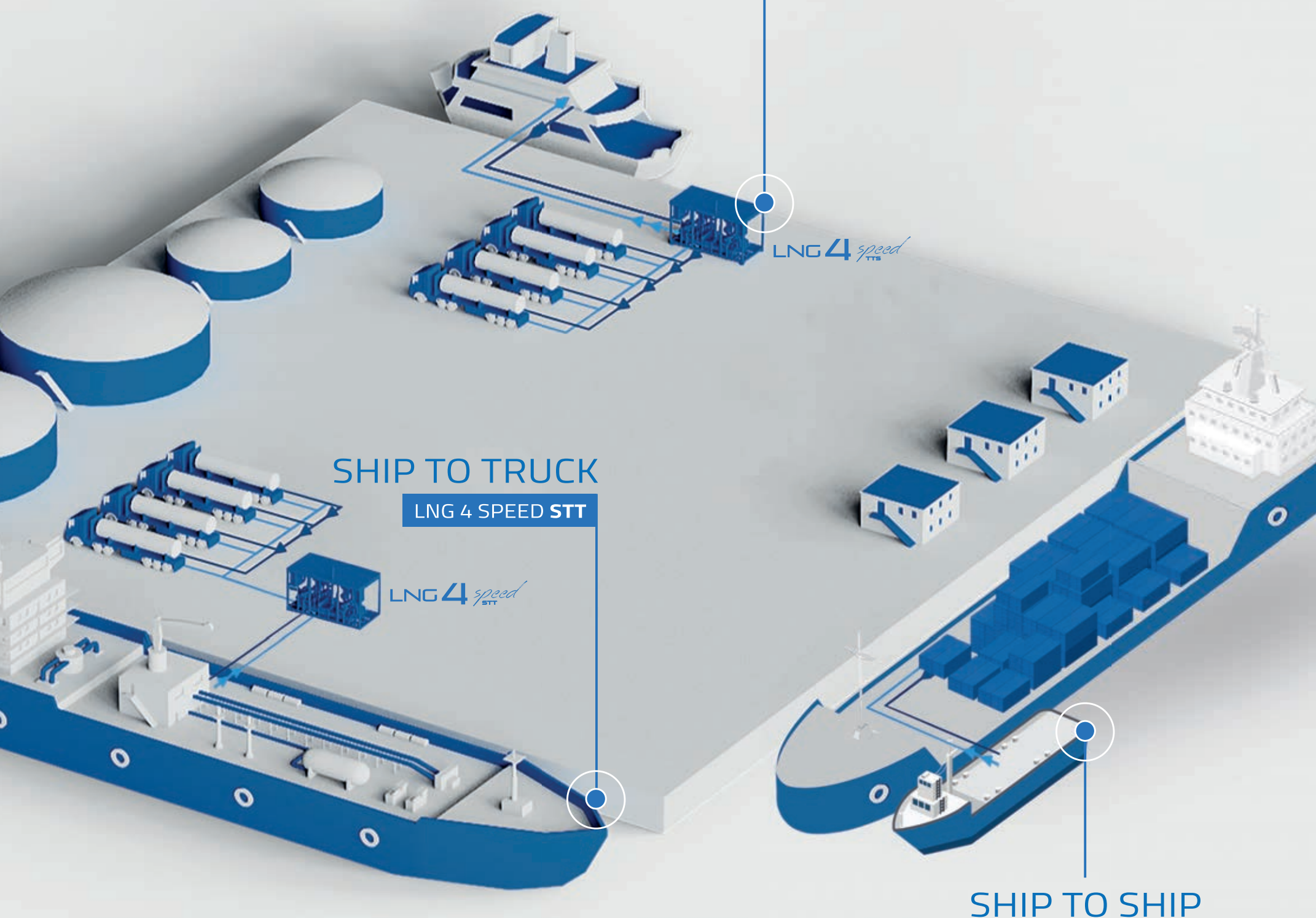
As the port begins work on its latest expansion it is also looking to the long term future, and the industry's transition to net zero. Dibble notes that the authority is continuously assessing and adapting its operational requirements "amid discussions within the industry regarding various fuel options" as it focuses on "transition to greener marine fuels in support of its journey towards carbon neutrality". ■



LNG vessel docked at Port Canaveral

TRUCK TO SHIP

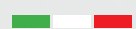
LNG 4 SPEED TTS



SHIP TO TRUCK

LNG 4 SPEED STT

SHIP TO SHIP



Leader in all bunkering solutions

Gas and Heat is an Italian company with **75 years of experience and a strong vocation to the future.**

Through a custom-made approach we provide our clients with solutions tailored to their specific needs. We design, build and deliver highly engineered solutions for **LNG** and **BIO LNG fuelling systems**, both in marine, inland waterway and land-based areas, as well as an energy source for small-sized on shore plants. Our R&D department engineers solutions for the adoption of alternative and greener fuels like **Ammonia and Hydrogen**.

The design and manufacturing cycle of the tanks is completely carried out in the **Tombolo Plant**, in the heart of Tuscany.

Discover all
our solutions



gasandheat.it



For the Record

CHINA imported more than 30 percent more liquefied natural gas in April than in the same month last year but shipments were still less than in March 2024, signalling an LNG surge that will increase this year's overall total.

Chinese imports of LNG in April soared by 31.5 percent to 6.22 million tonnes compared with 4.77MT in April 2023.

However, the data from the Chinese General Administration of Customs showed that the April 2024 deliveries were lower than the March 2024 imports that amounted to 6.65MT and had jumped year-over-year by 25 percent.

Imports of LNG by China in the January-to-April period now totalled 25.91MT, putting China on course for annual imports of around 77MT, up from last year's 71.44MT when the nation regained its No. 1 spot as the world's largest LNG importer.

This was 5.29MT ahead of the Japan's annual total of 66.15MT, a decline for the Japanese in the year of 8.1 percent compared with 71.99MT in 2022.

Main LNG suppliers to its network of 25 import terminals are Australia, Qatar, Malaysia, Indonesia and the Yamal plant in Arctic Russia.

China is also the largest recipient of global LNG spot cargoes along with Japan and South Korea.

The country's imports of natural gas by pipeline and as LNG jumped by nearly 21 percent in the first four months of 2024 from January through April, according to earlier data.

The Chinese imported 43MT of natural gas, an increase of 20.7 percent from the January-April period in 2023.

In April 2024 a total of 10.3MT was imported comprising 4.08MT of pipeline gas and the 6.22MT of LNG.

The Chinese receive varying volumes of pipeline gas mainly through links from the former Soviet republics of Central Asia and from Russia via Gazprom's "Power of Siberia" pipeline.

The LNG data for April 2024 was released along with that for Chinese exports of petroleum production such as gasoline, diesel and jet fuel.

China's gasoline exports in April fell to the lowest level since July 2015 as

domestic use of gasoline increased as the country's economy began to recover.

April exports of gasoline stood at 400,000 million metric tonnes, down 50.8 percent from April 2023 and 65 percent below March's 1.15MT.

Diesel exports were at 760,000 tonnes in April 2024, down by 46 percent from 1.42MT in March 2024, though higher than in April 2023.

Jet fuel exports in April were 1.59MT, up 90.4 percent from year-ago levels but down from 1.98MT in March.

ENBRIDGE, the North American pipelines and energy transportation company, reported a decline in earnings as it completed sales and acquisitions to swap around its assets and proceeded with natural gas ventures meeting LNG processing demand on the US Gulf Coast.

The Calgary, Alberta-based company posted first-quarter earnings of C\$1.42 billion (US\$1.04Bln), a drop from the C\$1.73Bln earned in the same three months of 2023.

Cash from operating activities fell to C\$3.15Bln from \$3.86Bln in the prior-year quarter.

However, Enbridge's cash flow from operations increased for the Gas Transmission division to C\$1.26Bln from C\$1.20Bln in the 2023 quarter while Gas Distribution and Storage earnings rose to C\$765M from C\$716M.

The largest portion of cash flow came from the Liquids Pipelines with C\$2.40Bln versus C\$2.35Bln in the 2023 quarter.

"During the quarter, we reached a significant milestone by closing the purchase of The East Ohio Gas Company and we are on track to close the remaining acquisitions in 2024," explained Greg Ebel, President and Chief Executive.

"We closed the divestiture of our interests in Alliance and Aux Sable on April 1 at an attractive valuation and have used the proceeds to fund a portion of the acquisitions and for debt reduction," Abel said.

"In Gas Transmission, we entered into a definitive agreement to acquire a strategic interest in the Whistler Parent Joint Venture, an integrated Permian Basin natural gas pipeline and storage network connecting natural gas supply to growing LNG and other US Gulf Coast demand," stated the CEO.

This also relates to Enbridge's wholly-owned Rio Bravo natural gas pipeline project to be linked to the Rio Grande

LNG export plant and any future projects.

Enbridge added that following the Tennessee Valley Authority's decision to proceed with construction of a new natural gas-fired combined cycle plant, the company has progressed to a final investment decision on the Tennessee Ridgeline Expansion.

The company also sanctioned new pipelines to serve Shell and Equinor's US Gulf Coast offshore Sparta development.

In Gas Distribution, Enbridge said that despite "significantly warmer weather" in the Canadian province of Ontario during the quarter, it was expecting continued customer growth.

"Enbridge Gas submitted a Notice of Motion with the Ontario Energy Board to review its rebasing decision and expect an outcome later this year. We are encouraged that the government of Ontario is preserving customer choice," said Enbridge.

The Government of Ontario advanced legislation that advocated access to safe and reliable natural gas at a reasonable cost.

Enbridge noted that in its Liquids Pipelines division it saw high utilisation across its systems.

"We also advanced our integrated US Gulf Coast infrastructure strategy by sanctioning additional storage at our Ingleside crude export facility and acquiring two marine docks and nearby land," said the company.

"These strategic investments augment our competitive position in the region and support attractive economics for our customers," it added.

EXMAR, the Belgian shipping company with a fleet of more than 40 gas carriers and floating terminal expertise and assets, posted strong first-quarter 2024 earnings helped by the performance of LNG assets in the Netherlands and Africa as Exmar also worked on other FLNG ventures.

Exmar, based in the Belgian port of Antwerp, said revenues increased for the first three months of 2024 to \$128.4 million from \$95.6M in the same three months of 2023.

The overall result for the period was \$22M, up from \$19.2M in the prior-year quarter.

Exmar stated that the financial performance in the first three months of 2024 reflected the employment of the floating regasification barge at the Eemshaven LNG hub at Groningen in the Netherlands.

It also gain from the LNG carrier "Excalibur" as well as the engineering, procurement and conversion works for the Congo LNG project with Italian major Eni.

"Eemshaven LNG continues to perform as per expectations," said Exmar.

With respect to the Marine XII project in the Republic of Congo, the company said that the "Tango FLNG" liquefaction barge produced its first LNG cargo during the first quarter of 2024, placing the Congo on the list of LNG-producing countries.

The "Excalibur" Floating Storage Unit operating alongside discharged its first cargo on February 27, 2024.

"In parallel Exmar continues working on various new floating LNG liquefaction projects and floating LNG regasification projects," said the company.

Exmar's engineering subsidiaries Exmar Offshore Company in Houston, Texas, and DV Offshore in Paris, France, have continued high utilization rates for their third-party engineering services.

Exmar's quarterly operating result from shipping amounted to \$36.7M compared with \$36.6M in the same three months of 2023.

The Very Large Gas Carriers "Flanders Pioneer" and "Flanders Innovation" continued to perform under their current contracts with Norwegian major Equinor.

Exmar added that the VLGC "BW Tokyo" is performing well in the BW VLGC pool and still benefits from "rewarding revenues" achieved in the VLGC segment.

The VLGC time charter equivalent rates per day came to \$35,375 per day in the first three months of 2024 versus \$44,681 per day in the prior-year quarter.

Midsize (38,000 cubic metres) rates were higher at \$26,528 per day in the first quarter compared with \$25,640 per day in the 2023 quarter.

"The MGC rates have also been sustainably firm on the back of the strong VLGC market, with a strong demand from LPG whilst the demand and tonne mile for ammonia transport was reduced from last year's strength due to lower natural gas prices," explained Exmar.

"The MGC fleet is for respectively 95 percent and 37 percent employed for 2024 and 2025 on term contracts," Exmar added.

Exmar also owns and operates 10 pressurized ships globally, that are employed for respectively 89 percent and 36 percent for 2024 and 2025 on a term basis.

"In the Far East, China's construction

and petrochemical industry are still under some pressure affecting propylene demand for the pressurized ships,” the company said.

“The staggering Chinese economy may further temper demand and rates in this segment. In the West, the coaster rates have remained stable,” Exmar said.

GALP Energia, the Portuguese oil and gas company, has agreed to cash in its 10 percent stake in the Area 4 concession in the Rovuma Basin of Mozambique operated by Italy's Eni by selling it to Abu Dhabi National Oil Company (ADNOC), the main energy operator in the United Arab Emirates.

The acquisition, valued at more than \$1 billion with contingences, will entitle ADNOC to a share of the LNG production of up to 25 million tonnes per annum including from FLNG and onshore developments.

The Area 4 concession already includes the operational “Coral-Sul FLNG” production vessel deployed offshore Mozambique and which shipped its first cargo from the Rovuma Basin in November 2022 to launch the southeast African nation as an LNG exporter.

“GALP has signed an agreement with ADNOC for the sale of its upstream assets in Mozambique,” said the Portuguese company.

“Area 4 includes Coral-Sul FLNG, in operation since 2022, as well as the prospective Coral North FLNG and Rovuma LNG onshore developments, both expected to be sanctioned during 2024-2025,” stated GALP.

Upon completion, GALP said it would receive around \$650 million for its shares and shareholder loans, already net of capital gains taxes.

As of the transaction reference date (December 31, 2023), lease liabilities were \$525M and additional contingent payments of \$100M and \$400M will be payable with the final investment decisions for the Coral North FLNG and Rovuma onshore LNG projects respectively.

GALP added that the transaction was subject to customary third-party approvals with completion expected during 2024.

Eni of Italy is the upstream operator of the Area 4 licence resources. Its other partners are US major ExxonMobil Corp., Chinese major China National Petroleum Corp. (CNPC), GALP Energia, Korea Gas Corp. and Mozambican oil and gas company ENH.

The agreed sale by GALP comes at a time when Mozambique is still undergoing security concerns in the northeast province of Cabo Delgado because of attacks on civilians by Islamist terrorists.

Previous attacks in the province have already delayed the onshore LNG developments by several years, including the TotalEnergies project from the Area 1 Rovuma Basin resources.

Serious moves had recently been underway to resume construction of the French-led project development on the Afungi Peninsula of Cabo Delgado before attacks resumed in mid-May 2024.

While Eni is the upstream operator of the Area 4 licence resources in the Coral South reservoir of the Rovuma Basin, the Italian major has conceded the operatorship in future onshore LNG developments to ExxonMobil.

“For over fifty years, ADNOC has been a reliable and responsible global provider of LNG and we are building on this role with this landmark investment in the world-class Rovuma supergiant gas basin in Mozambique as we deliver on our international growth strategy,” said Musabbeh Al Kaabi, ADNOC Executive Director for Low Carbon Solutions and International Growth after the deal with GALP was announced.

Mozambique is also planning a second FLNG project called the Coral North development, which is expected to produce a further 3.5 MTPA of LNG.

This was ADNOC's second LNG deal in May 2024 following its agreement to acquire a stake in NextDecade Corp.'s Rio Grande LNG export plant in Texas currently under construction.

ADNOC agreed to acquire a stake of 11.7 percent in the Phase 1 (Trains 1-3) of NextDecade's venture on the north shore of the Brownsville Ship Channel in South Texas.

Additionally, ADNOC and NextDecade announced that they had entered into a 20-year LNG offtake agreement from Rio Grande LNG Train 4.

In Mozambique, ADNOC noted that its stake in an onshore Mozambique project was in the 18 MTPA Rovuma Onshore LNG project with a modular, electric-drive design, referring to the Area 4 licence onshore development led by ExxonMobil.

As regards the long-delayed Mozambique onshore LNG projects, ExxonMobil Chief Financial Officer Kathy Mikells stated in an earnings conference call at the end of 2023 that the

Mozambique Rovuma onshore joint venture would enter its front-end engineering phase in 2024.

“We continue to work with our partners and the government to optimize the onshore LNG plans for the Rovuma Basin to develop the 85 trillion cubic feet of gas resources,” Mikells added at the time.

The separate Area 1 licence shareholders in the Rovuma Basin in addition to operator TotalEnergies with its 26.5 percent stake include Mozambican state-owned energy company ENH with 15 percent.

Other stakes are held by Japan's Mitsui with a 20 percent shareholding, three Indian companies, ONGC Videsh, Bharat PetroResources and Beas Rovuma Energy each with 10 percent and Thailand's PTTEP with 8.5 percent.

Another Indian company, Oil India Ltd., is also involved in the Area 1 Block through its 40 percent shareholding in Beas Rovuma Energy.

INDIAN liquefied natural gas imports increased again last month as more regasification infrastructure being put in place and domestic gas output growth helps meet demand from cities and industries.

LNG imports for the month of April rose by 3.7 percent to 1.93 million tonnes, or 29 cargoes, compared with 1.86MT, or 27 cargoes, received in April 2023 and higher than the 1.87MT delivered in March 2024.

India's LNG imports for the whole fiscal year from April 2023 to the end of March 2024 came to 22.87MT, up by 17.5 percent from the 19.46MT imported in the previous fiscal year.

That's as India's eighth LNG import terminal, the Chhara facility in the West Coast state of Gujarat, received its commissioning cargo on April 12 from the Punta Europa LNG export plant on Bioko Island in the African nation of Equatorial Guinea.

The Chhara LNG import terminal has 5 million tonnes per annum of capacity has been developed by Hindustan Petroleum Corp.

According to provisional data from India's Ministry of Petroleum and Natural Gas LNG cargoes for April 2024 cost around \$1.1 billion

The Ministry import data had earlier shown that LNG cargoes for the whole fiscal year from April 2023 to March 2024 cost India \$13.30Bln, which was around 22.5 percent lower than the \$17.10Bln

paid in the prior fiscal-year period.

Deliveries of LNG to Indian terminals have in the past year mainly come from Qatar, which provides over one-third of volumes, as well as West Africa, the US, Asia-Pacific nations and the spot market.

The Indian Ministry data showed that domestic natural gas production for April 2024 came to 2.958 billion cubic metres which was higher by 7.8 percent than the 2.745 Bcm of output in April 2023.

Reliance Industries, a leading Indian conglomerate with significant energy interests, started up a third gas field in the Krishna Godavari Basin KG-D6 block on the East Coast almost a year ago in a joint venture with BP of the UK.

Reliance and BP brought the MJ field on stream as the third part of a three-field project also involving the R-Cluster and the Satellite-Cluster fields.

The Ministry also gave average capacity utilization rates for the seven LNG terminals now operating and with data covering the whole 12 months of the fiscal year to the end of March 2024.

The total capacity of existing terminals has now risen to 52.7 MTPA from the eight facilities. However, the Chhara terminal will take several months to appear in the Ministry data book.

The largest Indian terminal at Dahej, located north of Mumbai and operated by Petronet LNG, has capacity of 17.5 MTPA and had the highest utilisation rate which rose to 95.1 percent of capacity.

At the Hazira facility, operated by Shell India, the utilisation rate for the 12 months was 30.3 percent from 5.2 MTPA of capacity.

The GAIL (India) terminal at Dabhol, south of Mumbai, reported 42.7 percent usage for its 5 MTPA.

The West Coast terminal at Mundra belonging to Gujarat State Petroleum Corp. had regas levels at 4.6 percent of capacity for 5 MTPA.

At the Kochi facility owned by Petronet in the southwest state of Kerala usage was 20.6 percent from 5 MTPA of regas capacity.

At the Kamarajar (Ennore) terminal owned by Indian Oil on the East Coast, regas capacity used was 18.3 from 5 MTPA.

At the second East Coast terminal, owned by the Adani group and TotalEnergies and located at Dhamra in the state of Odisha, the utilisation rate was 27.4 percent for its 5 MTPA.

The Ministry said that natural gas consumption for the month of April was 5.515 Bcm, which was 6.4 percent higher

than the 5.185 Bcm recorded in April 2023 but lower than the 5.594 Bcm logged for the previous month of March 2024.

The major consumers of natural gas in the country are the fertilizer industry with around 34 percent of consumption, city-gas 22 percent, power generation 15 percent, refineries 9 percent, petrochemicals 5 percent and others 15 percent.

JAPANESE liquefied natural gas imports rose by over 16 percent in April even at higher prices while thermal coal deliveries also increased as the nation additionally prepared for more nuclear plant re-starts in competition to LNG.

Japan's network of 37 terminals handled 5.28 million tonnes, or around 78 cargoes, in April 2024 compared with 4.53MT, or 67 shipments, in April 2023, an increase of 16.7 percent.

However, Japan's LNG deliveries in April were lower than in the previous month of March when they amounted to 5.55MT, down by 3 percent from the 5.72MT received in March 2023.

The April 2024 LNG cargoes cost 468.92Bln yen (\$3.00Bln), an increase of 12.5 percent compared with April 2023 when costs totalled 416.64Bln yen (\$2.66Bln).

Thermal coal imports also surged by 5 percent and amounted to 7.64MT for April and cost 188.96Bln (\$1.21Bln), which was 33.4 percent lower than was paid in April 2023.

The data from the Finance Ministry showed that deliveries of LNG from Asian nations like Malaysia and Indonesia amounted in April to 1.31MT, up 11.3 percent from the same month last year.

Deliveries from countries in the Middle East like Qatar came to 641,000 tonnes in April, a two-fold increase on the imports in April 2023.

US deliveries to Japan in April increased by 38.6 percent from April 2023 to 437,000 tonnes, while deliveries from Russia plunged by 18.5 percent to 288,000 tonnes.

The balance of the shipments in April came mainly from Australia and the spot market and amounted to 2.60MT, higher than the 2.49MT delivered in April 2023 and lower than the 2.71MT received in March 2024.

Japan's LNG deliveries for the full fiscal year to the end of March had amounted to 63.88MT, which was 8 percent lower than the previous fiscal year.

The nation's calendar year LNG

imports dropped by 8.1 percent in 2023 to 66.15MT compared with China's overall imports of 71.35MT.

The April import totals for both Japan and China showed that Chinese deliveries in the month were higher at 6.22MT versus the Japanese total of 5.28MT.

Japan is additionally continuing with its nuclear plant re-start programme and this could lessen the need for LNG imports in the medium term.

A total of 11 Japanese nuclear reactors are now back in operation compared with the 54 that were online in 2011 before the Fukushima disaster and which had supplied around 30 percent of Japan's energy needs.

The 11th nuclear restart was the Takahama-1 plant owned by LNG importing utility Kansai Electric Power and this compares with 33 reactors that are capable of re-starting.

The restarted reactors so far are: Genkai-3 and Genkai-4, Ikata-3, Mihama-3, Ohi-3 and Ohi-4, Sendai-1 and Sendai-2 and Takahama-1, Takahama-3 and Takahama-4.

Japan's Nuclear Regulation Authority is examining the re-start proposals for 10 more nuclear plants.

Among them is Chugoku Electric Power's plans to restart the No. 2 reactor at its Shimane nuclear power station in August 2024.

Japan's Tohoku Electric Power has also said that it planned to restart reactor No. 2 at its Onagawa nuclear plant around September 2024 after additional safety construction works had delayed the process.

JAPEX, the Japan Petroleum Exploration Company, and which is a long-standing LNG importer involved in domestic Japanese oil and gas projects and with stakes overseas in nations such as Iraq, Indonesia and the UK, reported a drop in profits as global prices weakened.

Japex said that in the fiscal year to the end of March net sales declined year-over-year to 325.86 billion yen (\$2.09Bln), down 3.2 percent from 336.49Bln yen (\$2.16Bln) in the previous fiscal year.

Japex supplies domestic gas in Japan through its 800-kilometres high-pressure gas pipeline network and also operates two LNG import terminals.

The company operates the Soma LNG terminal and the Yufutsu terminal and additionally owns the Fukushima gas-fired power plant.

Japex also produces Japan's limited

amounts of domestic oil and gas at 10 domestic field, including at the Yufutsu Oil and Gas Field in Tomakomai City in Hokkaido.

The company reported that operating profits in the year to March dropped by 11 percent to 55.24Bln (\$335.10M) from 62.08Bln yen (\$399.02M) in the prior-year period.

Net profits fell 20.4 percent to 63.66Bln (\$345M) from 67.39Bln (\$433M) in the previous year.

Basic earnings per share declined to 994.43 yen in the 2023-2024 fiscal year from 1,236 yen in the previous year.

"The main factors behind the year-on-year decrease for net sales and decrease for gross profit include a decrease in the selling prices of crude oil, natural gas, LNG and electricity due to the calming of the market prices of crude oil and others compared to the previous fiscal year," explained Japex.

In its overseas operations Japex is a stakeholder in the Al-Garraf oil field in Iraq, the Kangean project in Indonesia and the Seagull field in the UK North Sea.

Japex is also an investor in Sakhalin Oil and Gas Development Co. for the Sakhalin-1 oil project in the Russian Far East.

After the earnings were announced, Japex spoke to analysts and noted that the Al-Gharraf oilfield in Iraq would reach 200,000 barrels per day of output in 2024.

Al-Gharraf is located in southern Iraq and is being developed by Malaysia's Petronas and Japex and began production in 2013.

The oilfield is in the Dhi Qar governorate, 85 kilometres north of the city of Nasiriyah and has reserves ranging between 860 million and one billion barrels of oil.

Japex said that net sales from the exploration and production business increased by 58.4 percent 88.81Bln yen, mainly due to the growth of sales volume for crude oil in North America, Europe and the Middle East.

In the company's infrastructure and utility business net sales declined by 19.4 percent year-over-year to 172.14Bln yen

"This was mainly the result of a decrease in the selling prices following the calming in the market prices for crude oil and others, and decreased sales volumes for natural gas and LNG," Japex stated.

In its other businesses comprising drilling, geological surveys and the sale of

petroleum products like liquefied petroleum gas (LPG), income was stable at 64.90Bln, down just 2.8 percent.

In its outlook for the next 2024-2025 fiscal year, based on a Japan crude price of \$85 per barrel and an exchange rate of 140 yen to the dollar, Japex forecasts an increase of over 16 percent in net sales to 379.40Bln yen (\$2.43Bln).

"This is mainly due to the expected growth in sales volume of crude oil in US, Europe and the Middle East," stated Japex.

Profits attributable to main shareholders are expected to decrease by 20 percent to 42.8Bln yen.

JERA Co. Inc., Japan's biggest liquefied natural gas importer and utility company, has issued a new "realistic pathway" for its growth strategy through 2035 led by more than 35 million tonnes per annum of LNG volumes and huge investments.

JERA said the growth plan is underpinned by LNG as one of the key business pillars and including renewables with hydrogen and ammonia.

"These three pillars bring complementary synergies instrumental in driving steady and reliable progress toward decarbonization," said the company.

"They can be dynamically tailored to deliver optimal solutions that align with each customer, region or country's unique geographic and economic characteristics," JERA added.

JERA is Japan's biggest fossil-fuel electricity generator being owned jointly by Tokyo Electric Power Co. and Chubu Electric, the two largest power companies.

The company currently has three divisions. Firstly there is the Fuel Business including Transportation and Trading and secondly there is the Overseas Power Generation and Renewable Energy business.

The third business is Domestic Thermal Power Generation and Gas for sales of electricity and gas.

JERA also has the JERA Global Markets (JERAGM) energy and commodities trading business for LNG and other commodities.

JERA's 35 MTPA of LNG will support its targeted renewables capacity of 20 GW gigawatts, making it one of the largest Asian players.

As regards hydrogen and ammonia, JERA said it was aiming to have around 7 million tonnes per annum of handled volumes.

It plans a total cash flow investment of

5 trillion Japanese yen (\$32.15Bn) with between 1 and 2 trillion yens being allocated to each energy sector business.

“There will be a built-in flexibility to make allocation changes between the three business areas if deemed suitable in case of external changes,” JERA explained.

“At JERA, we are not just adapting to the evolving global energy landscape, we are actively setting the pace,” stated Yukio Kani, JERA’s Global Chief Executive and Chairman.

“With our new growth strategy, we are positioning ourselves at the forefront of the energy transition,” Kani added.

“Our vision will be made possible through strategic collaborations with our global partners. Built on mutual goals and a culture of diversity and openness, we and our partners will join forces to embark on a journey to transform the energy sector,” The JERA global chief declared.

MUBADALA ENERGY, the international company headquartered in Abu Dhabi in the United Arab Emirates, has made a second large natural gas discovery with LNG potential in the Andaman Sea offshore Indonesia.

The UAE energy company, whose parent is the sovereign wealth fund of Abu Dhabi, Mubadala Investment Company and an investor in the Rio Grande LNG project in Texas, said the latest Indonesian discovery was made close to the first find in the Layaran-1 exploration well located 100 kilometres (62 miles) offshore North Sumatra.

Mubadala Energy said that second find adds to the potential of the Indonesian resources after the first discovery in December 2023 was estimated to have over 6 trillion cubic feet of gas in-place.

Mubadala said the second discovery in the South Andaman production sharing contract area detected substantial gas from the Tangkulo-1 exploration well, drilled in South Andaman, about 65 kilometres offshore North Sumatra.

Tangkulo-1 was drilled to a depth of 3,400 metres in 1,200 metres water depth, less than six months after the major discovery at the Layaran-1 well.

The Tangkulo-1 well encountered 80 metres of gas column in a good quality Oligocene sandstone reservoir.

“Utilizing a new Drill Stem Test (DST) design, the well successfully flowed 47 million standard cubic feet per day of excellent gas quality and 1,300 barrels of

condensate,” the company explained.

Mubadala said that although testing was constrained by the facilities, the estimated well capacity was around 80-100 million standard cubic feet per day and over 2,000 barrels of condensate.

“When added to our recent success at Layaran-1, this game-changing discovery promises to transform Indonesia’s and Southeast Asia’s energy landscape and demonstrates that South Andaman is one of the world’s most exciting energy plays,” declared Mansoor Mohammed Al-Hamed, Chief Executive of Mubadala Energy.

“By working with partners and harnessing our world class technical capabilities, I am confident we can realize the full potential of this block, in line with our commitment to support the government’s ambitious development timeframes,” stated Al-Hamed

With an 80 percent working interest in South Andaman, Mubadala is the largest net acreage holder in the area.

“In line with company’s gas-biased strategy, Tangkulo-1 is an important pillar in the cluster’s development story, with the discovery unlocking further potential in the southern part of the block and indicating an additional multi-trillion cubic feet of prospective gas resource in nearby structures,” the company added.

SAIPEM, the Italian energy and LNG engineering company specialising in subsea work, has been awarded three contracts valued at \$3.7 billion in the LNG exporting nation of Angola and on behalf of French major TotalEnergies.

The three Saipem awards are in Angola’s Block 20 oil and gas fields for the Kaminho project relating to the development of the Cameia and Golfinho oil fields, located 100 kilometres (62 miles) off the coast of Angola.

The first contract refers to the engineering, procurement, construction, transportation and commissioning of the Kaminho floating production storage and Offloading (FPSO) vessel.

The second contract entails the Operation and Maintenance (O&M) of the same FPSO for a firm period of 12 years with a potential eight-year extension, leveraging on the expertise acquired from three other FPSOs currently operating in Angolan waters.

The third contract involves the engineering, procurement, supply, construction, installation, pre-commissioning and assistance for the commissioning and start-up of a Subsea, umbilicals, risers and flowlines (SURF)

package which includes about 30 kilometres of 8-inch and 10-inch subsea flowlines and risers, and umbilicals.

“The associated structures will be fabricated in Saipem’s local yard in Ambriz,” said Milan-based Saipem.

Saipem’s statement followed meetings held on May 20 in Angola by Patrick Pouyanné, the Chairman and Chief Executive of TotalEnergies, to announce a final investment decision for the Kaminho project.

Pouyanné held talks with João Lourenço, the President of Angola, and Diamantino Azevedo, the Minister of Mineral Resources.

Pouyanné also held discussions with Angola’s leading state energy executives including Paulino Jerónimo, Chairman and CEO of the National Agency of Petroleum, Gas and Biofuels (ANPG) and Gaspar Martins, Chairman and CEO of national oil and gas company Sonangol.

TotalEnergies holds 40 percent of the Kaminho project and the other Block 20/11 partners are Malaysia’s Petronas with 40 percent and Sonangol with a 20 percent holding.

The Kaminho project’s Cameia and Golfinho fields are located in water depths of 1,700 metres and the venture is the first large deepwater development in Angola’s Kwanza Basin.

“The first development in the maritime zone of the Kwanza Basin is important to showcase the opening of new oil frontiers in Angola, and it’s part of our strategy to keep Angola on the top of African oil producers, bringing important income to our economy,” stated ANPG’s Jerónimo.

Sonangol’s CEO Martins said that the FID for the Kaminho project shows the commitment and efforts made by the Angolan government as well as the partners TotalEnergies, Sonangol and Petronas.

“The right conditions are now in place to contribute to increasing national production of oil and natural gas, and with that the revenues for the country,” Martins stated.

SEATRIUM of Singapore, a leading global company in repairing, upgrading or refitting LNG carriers, has signed a favoured customer contract with a South Korean shipping company.

Seatrium signed its FCC deal with Hyundai LNG Shipping, marking its first long-term strategic partnership agreement with a Korean LNG transporter for the repairs and upgrades of its LNG carriers.

“The contract includes the refit of a series of LNG carriers over the next two years, with responsibilities in joint planning, information and experience sharing with Hyundai LNG Shipping,” Seatrium explained.

Seatrium has an extensive track record in LNG shipping as the leader in repairs and upgrades and conversions of carriers to floating storage and regasification units as well as liquefaction vessels.

The partnership agreement was signed in South Korea by JinChul Hong, Vice President of Hyundai LNG Shipping and Alvin Gan, Executive Vice President of Repairs and Upgrades at Seatrium.

The two companies will jointly work towards achieving cost efficiency and timely deliveries, which are some of the key performance indicators for high-quality LNG refit maintenance.

Hyundai LNG Shipping has eight conventional LNG carrier and one LNG bunkering vessel in its fleet.

These include six vessels with Moss-type storage tanks and two with membrane storage.

In addition to the LNG carriers, Hyundai also operates six Very Large Gas Carriers in the liquefied petroleum gas sector.

“This strategic partnership marks a significant milestone for us. By collaborating with Seatrium, we aim to enhance our operational efficiency and instill the highest standards of quality, safety, and environmental sustainability in the maintenance of our LNG carriers,” stated Hyundai’s JinChul Hong.

“Our first LNG retrofit under the FCC agreement scheduled for repairs in Seatrium’s Admiralty Yard in Singapore is the ‘Hyundai Utopia’ in May 2024, and we look forward to a fruitful and successful partnership with Seatrium,” he added.

Seatrium’s Alvin Gan said the Singaporean company was honoured to partner with Hyundai LNG Shipping on this FCC.

“This agreement not only underscores our leadership in LNG carrier repairs and upgrades but also reflects our commitment to delivering excellence and innovation in every project we undertake,” explained Gan.

“We look forward to a successful collaboration that will benefit both parties and contribute to the advancement of the LNG industry,” Gan declared.

TANZANIA in East Africa has signed an agreement to develop a small-scale LNG project to boost domestic gas use ahead of a planned large-scale LNG export project.

Tanzania Petroleum Development Corp. (TPDC) said the agreement was signed in the port city of Dar Es Salam in Tanzania with Egyptian company Rosetta Energy Solutions, a subsidiary of the Taqa Arabia group, and the African investment bank Africa50.

“The project will feature a small-scale liquefaction plant in Dar es Salaam, a fleet of cryogenic containers for road transportation, and regasification plants near customer locations to convert LNG back to natural gas,” the statement explained.

“The Virtual LNG Pipeline will provide reliable, economical, and clean energy to households, industries and the transportation sector,” it added.

Rosetta Energy said it aimed to help Tanzania establish itself as a regional energy hub, leveraging the extensive expertise of Taqa Arabia in pipeline gas, LNG, renewables, power and water solutions.

With a modular design allowing scalable LNG capacity to match varying demand, the virtual pipeline can accommodate fluctuating energy demands in developing areas where future growth in energy requirements is anticipated.

“This agreement is key for our aspiration to be Tanzania’s first LNG developer,” said Karim Shaaban, Chief Executive of Rosetta Energy.

“It underscores our commitment to enhancing Tanzania’s natural gas infrastructure, providing competitively priced and reliable energy to foster sustainable industrial growth and local

community prosperity,” Shaaban added.

“With a target investment exceeding \$100 million, the project will generate multiple jobs throughout the value chain,” he stated.

“Together with our partners, we aim to accelerate the project with potential construction starting as early as 2025,” Shaaban said.

Rosetta noted that the finance partner in the Tanzanian small-scale LNG project is Africa50, a Pan-African Investment Platform established by African countries and the African Development Bank to help bridge Africa’s infrastructure funding gaps.

TPDC is additionally a minority partner in the long delayed Tanzania LNG export project with plans to liquefy the extensive natural gas resource discovered offshore Tanzania in recent years.

The international companies with the gas assets include Equinor of Norway and UK-based Shell, while ExxonMobil and several smaller energy companies are also potential shareholders.

LNG development could also gain traction from the start of construction of a separate regional trans-national project, the East African Crude Oil Pipeline (EACOP) which has entered the construction phase

EACOP Ltd. is a special purpose company, governed by its shareholder agreement and in which French major TotalEnergies has 62 percent, Uganda National Oil Company (UNOC) 15 percent, Tanzania’s TPDC 15 percent and China National Offshore Oil Corp. 8 percent.

EACOP will transport crude oil from the onshore fields in the Lake Albert region of land-locked Uganda from Kabaale-Hoima in Uganda to the

Chongoleani peninsula near Tanga in Tanzania where it will be shipped to world markets.

The East African pipeline will run for over 1,440 kilometres (895 miles) and the major regional export system will include 296km of pipeline in Uganda and 1,147km in Tanzania.

WOOD MACKENZIE, the UK energy consultants, said the tiny South American nation Suriname now holds discovered resources of more than 2.4 billion barrels of oil and liquids and more than 12.5 trillion cubic feet of gas and with an LNG export project is being contemplated.

“We understand the Roystonea and Fusaea fields have recoverable resources approaching 400 million barrels,” said a report.

Wood MacKenzie said this could be enough to support a floating production and offloading unit with an oil processing capacity of up to 100,000 barrels per day.

Nine deepwater fields have been discovered since 2019 in the waters of Suriname, located in the northeast corner of South America.

However, Suriname is still awaiting its first sanctioned oil or gas developments.

According to Wood Mackenzie, TotalEnergies and APA Corp. of the US are close to sanctioning a cluster FPSO development on Block 58.

Block 52 is east of Block 58 and has different owners with Malaysia’s Petronas as operator and with a 50 percent stake held by partner ExxonMobil Corp.

Fusaea is the third discovery in the Block 52, following other finds named Sloanea and Roystonea.

“In addition, APA Corporation, Petronas and CEPSPA of Spain drilled the

2022 Baja discovery in Block 53,” explained Wood Mackenzie.

“This is eight kilometres north of Roystonea and could eventually be part of a wider cluster development,” the report added.

Petronas has already secured a pledge of tax relief if it develops gas on the block.

The 2020 Sloanea discovery is now being appraised with a second well.

“Gas resources there of 2 Tcf could anchor a floating LNG development in the early 2030s,” said Luiz Hayum, Principal Upstream Research Analyst for Latin America Upstream at Wood Mackenzie.

“Also, the Fusaea well had more associated gas than expected and could add resources to support future gas development,” stated Hayum.

Wood Mackenzie now estimates Suriname’s discovered resources at more than 2.4 billion barrels of oil and liquids and more than 12.5 Tcf of gas.

ExxonMobil, as the 50 percent non-operating partner in Fusaea and Block 52 in Suriname, has a much larger footprint in neighbouring Guyana.

The US major sanctioned the sixth FPSO (Jaguar) in Guyana’s Stabroek block in April 2024.

“Our valuation for Stabroek’s ten-FPSO development is over US\$150 billion at US\$65/barrel Brent prices split between the government and the three block partners,” Hayum added.

The consultants noted that since 2016, Petronas has built a sizeable deepwater position across the Americas and Africa.

“Suriname is a bright spot from those exploration efforts. It plays to Petronas’ existing competencies in LNG development while providing oil to offset its LNG-weighted portfolio,” the report added. ■

LNG Journal Subscription Package

Your LNG Journal subscription includes broad coverage of LNG across the globe - from trade and shipments through to LNG prices, plus in-depth technical coverage.

With over 20 years of LNG reporting experience, we remain the market leading source of information for decision makers in the LNG industry.

Subscription Contacts

For new subscriptions or general subscription queries contact:
[Stephan Venter](mailto:Stephan.Venter@lngjournal.com)
venter@lngjournal.com
+44 207 017 3407

To renew an existing subscription or to upgrade your package, contact:
[Gabi Weck](mailto:Gabi.Weck@lngjournal.com)
gabi@lngjournal.com

Sign up now for an Online Subscription at only US\$1190; €920 or £830

Discount options are available for multi-users

Contact us for more information or to arrange a free trial



Explanatory Notes

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

In addition to our own database, the information in these tables has been derived and cross-referenced from multiple sources, including GEM, IEEJ, IGU, GIE, GIIGNL and facility operators/ developers.

Comments, corrections or additional information would be most welcome. They should be sent to alexander@lngjournal.com

Conventional LNG Terminals

Country	Location (Project)	Owners	Start up	Nom. Capacity (MTPA)	Storage Tanks	Capacity
Belgium	Zeebrugge	Fluxys	1987	6.6	5	566,000
Canada	St. John (Canaport) LNG	Repsol	2009	7.1	3	480,000
Chile	Mejillones LNG	Tractebel Engie, Ameris Capital AGF	2010	1.5	1	187,000
	Quintero	ENAP, Metrogas, Enagas	2009	3.8	3	334,000
China	Beihai LNG	PipeChina	2013	6.0	4	640,000
	Caofeidian LNG	PetroChina	2012	10.0	8	1,280,000
	Caofeidian Xintian LNG	China Suntien Green Energy Corp.	2023	5.0	2	–
	Dalian LNG	PipeChina	2011	6.0	3	480,000
	Dongguan LNG	JOVO Energy	2010	1.5	2	160,000
	Fujian LNG	CNOOC	2008	6.3	6	960,000
	Guangdong Dapeng LNG	CNOOC	2006	6.8	4	640,000
	Hainan LNG	PipeChina	2014	3.0	2	320,000
	Hainan Transfer Station	PetroChina	2020	0.6	2	40,000
	Jiangsu LNG	PetroChina	2011	10.0	5	1,080,000
	Jieyang LNG	PipeChina	2018	4.2	3	480,000
	Nansha LNG	Guangzhou Gas	2023	1.0	2	160,000
	Pinghu LNG	Zhejiang Hangjiaxin Clean Energy	2022	1.0	2	200,000
	Qidong LNG	Guanghui Energy	2009	4.0	5	620,000
	Qingdao LNG	Sinopec	2006	7.0	6	960,000
	Shanghai (Yangshan) LNG	CNOOC	2009	3.0	5	895,000
	Shanghai Peak Shaving	Shenergy	2008	1.5	5	320,000
	Shenzhen Peak Shaving	Hua'an	2012	0.8	1	80,000
	Shenzhen Diefu LNG	PipeChina	2018	4.0	4	640,000
	Tianjin - Nangang LNG	Sinopec	2018	6.0	4	640,000
	Tianjin LNG	PipeChina	2013	6.0	7	397,000
	Tianjin Binhai LNG	Beijing Gas	2023	5	10	–
	Wenzhou LNG	Zhejiang Energy, Sinopec	2023	3.0	4	–
	Yancheng LNG	CNOOC	2022	3.0	4	880,000
	Zhejiang LNG	CNOOC	2018	6.0	6	960,000
	Zhoushan LNG	ENN	2018	5.0	4	640,000
	Zhuhai LNG	CNOOC	2014	3.4	3	480,000
Dominican Republic	Andres LNG	AES Andres	2003	1.9	1	160,000
France	Dunkerque Le Clijpton	EDF, Fluxys, TotalEnergies	2016	9.5	3	600,000
	Fos-sur-Mer	TotalEnergies, Elengy	2010	9.2	4	410,000
	Montoir-de-Bretagne	Elengy	1980	8.0	3	360,000
Greece	Revithoussa	DESFA	2000	7.1	3	225,000
India	Cochin	Petronet	2013	5.0	2	368,000
	Dabhol	GAIL, NTPC	2007	5.0	3	480,000
	Dahej	Petronet	2004	17.5	6	932,000
	Ennore LNG	IndianOil LNG	2019	5.0	2	360,000
	Hazira	Shell, TotalEnergies	2005	5.0	2	320,000
	Mundra LNG	Adani, GSP	2019	5.0	2	320,000
	Dhamra LNG	Adani, TotalEnergies	2023	6.5	2	360,000
Indonesia	Arun Conversion	Pertamina	2015	3.0	4	508,000
Italy	Panigaglia	Snam	1963	2.5	2	100,000
	Rovigo Adriatic LNG	QatarEnergy, ExxonMobil, Snam	2009	6.6	2	250,000
Jamaica	Montego Bay	New Fortress Energy	2020	0.5	7	7,000
Japan	Chita	JERA, Toho Gas	1977	24.0	14	1,560,000
	Fukuoka	Saibu Gas	1993	0.8	1	70,000
	Futtsu	JERA	1985	20.0	10	1,110,000
	Hachinohe	ENEOS	2015	1.6	2	280,000
	Hatsukaichi	Hiroshima Gas	1996	0.9	2	170,000
	Hibiki LNG	Saibu Gas, Kitakyushu Gas	2014	4.0	2	360,000
	Higashi-Ogishima	Tokyo Electric	1984	15.0	9	540,000
	Himeji	Kansai Electric, Osaka Gas	1979	12.9	15	1,360,000
	Hitachi LNG	JERA	2015	2.2	2	230,000
	Ishikari LNG	Hokkaido Gas	2012	1.4	1	180,000
	Joetsu LNG	JERA	2012	2.3	3	540,000
	Kagoshima	JERA	1996	0.2	1	86,000
	Kawagoe	Chubu Electric	1997	8.0	3	480,000
	Mizushima	Chugoku Electric, ENEOS	2006	1.7	2	320,000
	Nagasaki LNG	Saibu Gas	2003	0.1	1	35,000
	Nakagusuku LNG	Okinawa Electric	2012	0.7	2	280,000
	Negishi	TEPCO, JERA	1969	11.0	14	1,180,000
	Niigata	Tohoku Electric	1984	10.0	8	720,000

Conventional LNG Terminals (Continued)

Country	Location (Project)	Owners	Start up	Nom. Capacity (MTPA)	Storage Tanks	Storage Capacity
Japan (continued)	Ogishima	JERA	1998	3.0	4	850,000
	Oita	Kyushu Electric	1990	5.1	5	460,000
	Sakai	Kansai Electric	2006	6.4	4	420,000
	Sakaide	Shikoku Electric, Cosmo Oil, Shikoku-Gas	2010	1.2	1	180,000
	Senboku	Osaka Gas	1972	12.5	20	1,675,000
	Shin Sendai	Tohoku Electric	2016	1.0	2	320,000
	Sodegaura	JERA	1973	29.4	35	2,660,000
	Sodeshi Shimizu	Shizuoka Gas, ENEOS	1996	2.9	3	337,200
	Soma LNG	JAPEX	2018	1.5	2	460,000
	Tobata Ward	Kita-Kyushu LNG	1977	7.6	8	480,000
	Toyama LNG	Hokuriku Electric	2018	1.8	1	180,000
	Yanai	Chugoku Electric	1990	2.4	6	480,000
	Yokkaichi	Chubu Electric	1987	7.2	2	320,000
Kuwait	Al Zour LNG	KIPIC	2022	22.0	8	1,800,000
Malaysia	Pengerang LNG	Petronas	2017	3.5	2	400,000
Mexico	Energia Costa Azul	Sempra	2008	7.6	2	320,000
	Manzanillo	Samsung, KOGAS, Mitsui	2012	3.8	2	300,000
Netherlands	Maasvlakte Gate Terminal	Gasunie	2011	8.9	3	540,000
Panama	AES Costa Norte LNG	AES	2018	1.5	1	130,000
Philippines	PHLNG	AG&P	2023	5.0	1	137,512
Poland	Swinoujscie LNG	Polskie LNG	2015	3.6	2	320,000
Portugal	Sines	REN	2004	5.6	3	390,000
Puerto Rico	Penuelas	EcoElectrica	2000	1.4	1	160,000
Singapore	Singapore LNG	Singapore LNG Corp.	2013	11.0	4	800,000
South Korea	Boryeong	GS Energy	2017	10.8	6	1,200,000
	Gwangyang	POSCO Energy	2005	7.1	5	730,000
	Incheon	KOGAS	1996	54.4	23	3,480,000
	Pyeongtaek	KOGAS	1986	41.0	23	3,360,000
	Samcheok	KOGAS	2014	11.6	12	2,400,000
	Tongyeong	KOGAS	2002	26.6	17	2,600,000
	Jeju Island	KOGAS	2019	1.1	2	90,000
Spain	Bahia de Bizkaia LNG	BP, Enagás, EVE	2003	6.9	3	450,000
	Barcelona	Enagás	1969	12.6	6	760,000
	Cartagena	Enagás	1989	8.7	5	587,000
	Huelva	Enagás	1988	8.7	5	619,500
	Mugardos	Reganosa	2007	2.6	2	300,000
	Sagunto	Enagás	2006	6.4	4	600,000
	El Musel	Enagás	2023	5.8	2	300,000
Taiwan	Taichung	CPC	2009	7.0	6	960,000
	Yung-An	CPC	1990	10.5	6	690,000
Thailand	Map Ta Phut LNG	PTT	2011	19.0	6	940,000
Turkey	Izmir	EgeGaz	2006	10.6	2	280,000
	Marmara Ereglisi	BOTAS	1994	4.2	3	255,000
UK	Dragon LNG	Shell, Ancala Partners	2009	6.5	2	320,000
	Isle of Grain	National Grid	2005	14.8	8	1,000,000
	South Hook LNG	QatarEnergy, ExxonMobil, TotalEnergies	2009	15.6	5	775,000
United States	Everett Marine Terminal	Constellation Energy	1971	5.1	2	155,000
Vietnam	Thi Vai LNG	PetroVietnam Gas	2023	1.0	1	180,000

FSRU Terminals

Country	Location (Project)	Owners	Start up
Argentina	Escobar GasPort	Excelerate/Enarsa	2011
	Bahia Blanca	YPF	2023
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
	Terminal Gás Sul	New Fortress Energy	2024
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
El Salvador	Acajutla	Energía del Pacifico	2022
Finland	Inkoo FSRU	Gasgrid Finland	2022
France	Le Havre	TotalEnergies	2023
Germany	Wilhelmshaven FSRU	Uniper	2022
	Lubmin FSRU	Deutsche ReGas	2022
	Brunsbüttel	RWE	2023
Ghana	Tema LNG	Helios/GNPC	2021
Greece	Revithoussa FSU	DESFA	2022
	Alexandroupolis	Gastrade	2024
Hong Kong, China	FSRU Bauhinia	CLP Power	2023

Country	Location (Project)	Owners	Start up
India	Jaigarh (Mothballed)	H-Energy	2022
Indonesia	Lampung	Hoegh LNG, PGN LNG	2014
	Nusantara (Jakarta Bay)	Golar LNG, Pertamina	2012
	Benoa LNG	PT Pertamina Niaga	2016
	Amurang	Karadeniz	2020
	Jawa Satu FSRU	Pertamina	2021
Italy	Livorno	OLT Offshore LNG Toscana	2013
	Piombino	Snam	2023
Jamaica	Old Harbour	Golar FSRU, New Fortress	2019
Jordan	Aqaba, Jordan	Golar LNG	2015
Lithuania	Klaipeda	Klaipedos Nafta Hoegh LNG	2014
Malaysia	Malacca FSRU	Petronas	2012
Malta	FSU Armada Mediterrana	ElectroGas	2016
Myanmar	Thanlyin	CNTIC Vpower	2020
Netherlands	Eemshaven	Gasunie	2022
Pakistan	Port Qasim	Excelerate, Engro Corp	2015
	Port Qasim	BW-Mitsui, PGP Consortium	2017
Philippines	PHLNG	AG&P International	2023
	FGEN Batangas LNG	First Gen Corp.	2023
Russia	Kaliningrad FSRU	Gazprom	2020
Senegal	Dakar	KarMOL	2023
Turkey	Iskenderun & Saros FSRUs	BOTAS	2016 & 2023
	Aliaga (ETKI LNG)	Etki Liman	2017
UAE	Ruwais, Abu Dhabi	Gasco (UAE)	2016
	Jebel Ali Port, Dubai	DSA (UAE)	2010

Future LNG Import Projects

Country	Location/Project	Owners	Start up	Nom. Capacity (MTPA)	Storage Tanks	Capacity	Status
Albania	Port of Vlora FSRU	Excelerate Energy, ExxonMobil	–	3.5	–	–	Speculative
Australia	Port Phillip Bay FSRU	Vopak	2024	–	–	–	Speculative
	Geelong FSRU	Viva Energy	2024	–	–	–	Speculative
	Adelaide FSRU	Venice Energy	2024	–	–	–	Speculative
	Port Kembla FSRU	Squadron Energy	2026	1.9	1	170,000	U. Construction
Bangladesh	Matarbari LNG	Petrobangla	2028	7.5	–	–	Speculative
	Payra FSRU	Excelerate Energy	2028	–	–	–	Speculative
Belgium	Zeebrugge Exp. I	Fluxys	2024	4.6	–	–	U. Construction
	Zeebrugge Exp. II	Fluxys	2026	1.3	–	–	U. Construction
Brazil	Tergás Rio Grande LNG	Grupo Cobra	2024	1.61	–	–	Speculative
	Geramar FSRU	–	2026	–	–	–	Speculative
	Porto Norte Fluminense FSRU	Porto Norte Fluminense SA	2027	5.64	–	–	Speculative
	Imetame LNG	Imetame	2025	–	–	–	Speculative
China	Penglai LNG	Shandong Penglai Baota Ina Natural Gas Co., Ltd.	2026	2.8	–	–	Proposed
	Wuhan LNG	Hubei Minsheng Petroleum Liquefied Gas Co., Ltd.	2035	1.86	–	–	Speculative
	Zhiwan Island LNG	Macau Gas Co.	–	5	–	–	Speculative
	Yueyang LNG	Yueyang LNG Co., Ltd.	2024+	1.5	–	–	Speculative
	Yangjiang LNG	Guangdong Yangjiang Hailing Bay LNG Co., Ltd.	2024+	2.8	2	–	U. Construction
	Rudong LNG (Jiangsu Guoxin)	Jiangsu Guoxin LNG Co., Ltd.	2024	2.95	–	–	U. Construction
	Jiangyin LNG (Garson Gas)	Jiangsu Jiasheng Gas Co., Ltd.	2024	3	–	–	U. Construction
	Huizhou LNG	Guangdong Huizhou LNG Co., Ltd.	2024	4	–	–	U. Construction
	Longkou	PipeChina	2024	5	6	1,420,000	U. Construction
	Yingkou LNG	China Urban Rural Energy	2025	6.5	4	800,000	U. Construction
	Yancheng LNG Expansion	CNOOC	2024	3	–	1,620,000	U. Construction
	Yantai LNG	China Urban Rural Energy	–	5.9	5	1,000,000	U. Construction
	Zhangzhou LNG	PipeChina	2024	3	3	–	U. Construction
Colombia	Buenaventura FSRU	Unidad de Planeación Minero Energética (UPME)	2024	–	–	–	Speculative
Cyprus	Vasilikos FSRU	DEFA	2024	0.6	–	–	U. Construction
Ecuador	Jambelí FSRU	Sycar LLC	2025	0.38	–	–	Proposed
Estonia	Paldiski LNG	Espa	2024	1.8	–	–	Proposed
Germany	Stade LNG	Buss Group, Dow Chemical, Fluxys, Partners Group	2026	9.78	–	–	Proposed
	TES Wilhelmshaven LNG	Tree Energy Solutions	2025	11.76	–	–	Proposed
	Stade FSRU	German company Hanseatic Energy Hub	2024	3.5	–	–	U. Construction
Greece	Dioriga FSRU	Motor Oil	2024	1.91	–	–	Proposed
	Argo FSRU	Mediterranean Gas	2024	3.38	–	–	Proposed
	Thessaloniki FSRU	Edison, Hellenic Petroleum	2025	5.37	–	–	Proposed
India	Jaigarh LNG	H-Energy	–	8	–	–	Speculative
	Kakinada FSU	H-Energy	2024	4	–	–	Speculative
	Kukrahati LNG	H-Energy	2024	3	–	180,000	Speculative
	Chhara LNG Terminal	Hindustan Petroleum	2025	5	–	–	U. Construction
	Karaikal LNG	AG&P	TBC	5	–	–	Speculative
Indonesia	Karimun Island LNG	Panbil Group	2024	–	–	–	Speculative
	Sengkang LNG	Energy World	–	2	–	–	U. Construction
Ireland	Mag Mell FSRU	Predator Oil & Gas	–	1.91	–	–	Speculative
Italy	Porto Torres FSRU	Snam	2024	0.5	–	–	Proposed
	Gioia Tauro LNG	Iren Group, Sorgenia	2026	8.6	–	–	Proposed
	Portovesme FSRU	Snam SpA	2024	–	–	–	Speculative
Morocco	Jorf Lasfar LNG	SIGER/ERGIS Group	2025	5.15	–	–	Speculative
Mozambique	Matola FSRU	Gigajoule, TotalEnergies, CTB, Matola Gas Co.	2025	0.5	–	–	Speculative
Myanmar	Mee Laung Gyaing FSRU	Supreme Group, ZHEFU Hydropower	2025+	–	–	–	Speculative
	Ahlone LNG	TTCL	2025+	–	–	–	Speculative
	Thilawa LNG	Eden Group, Marubeni Corp., Mitsui, Sumitomo Corp.	2026	–	–	–	Speculative
Pakistan	Tabeer Energy FSRU	Mitsubishi	–	5.7	–	–	Speculative
Philippines	Vires FSRU	Argo Group	–	3	–	–	Speculative
	Pagbilao Power	Energy World	–	3	2	260,000	U. Construction
Poland	Gdańsk FSRU	PGNiG	2028	8.82	–	–	Speculative
South Africa	Richards Bay FSRU	South Africa Department of Public Enterprises	2027	1	–	–	Speculative
South Korea	Dangjin LNG	POSCO	2027	3.5	–	–	Proposed
	Hanyang LNG	Hanyang Group	2024	–	–	–	Speculative
Sri Lanka	New Fortress Colombo LNG	New Fortress Energy	–	0.71	–	–	Speculative
Taiwan	Hsieh-Ho LNG	Taipower	2025	1.8	–	–	Proposed
	Taichung (TaiPower) LNG	Taipower	2025	3	–	–	Proposed
Thailand	Chana LNG	–	2028	2	–	–	Speculative
Vietnam	Hai Linh	Hai Linh Co. Ltd.	2020	3	3	219,000	Mothballed
	Mui Ke Ga FSRU	B.Grimm Power, Energy Capital Vietnam, Gunvor	2025	1.5	–	–	Proposed
	Son My LNG	AES, PetroVietnam	2026	3.6	–	–	Proposed
	Thai Binh FSRU	–	2026	0.5	–	–	Speculative
	South West FSRU	–	2030	1	–	–	Speculative
	Bac Lieu LNG	Delta Offshore Energy	–	2	–	–	Speculative
	Cat Hai FSRU	Chubu Electric, ExxonMobil, Government of Hai Phong, TEPCO	2030	3	–	–	Speculative
	Khanh Hoa LNG	Millenium Energy	2030	3	–	–	Speculative
	Long Son LNG	EVN	2025	4.4	–	–	Speculative
	Tien Lang FSRU	ExxonMobil, Chubu Electric Power, Tokyo Electric Power Co.	2026	–	–	–	Speculative
	Ca Na LNG	Novatek	2024	–	–	–	Speculative
	Chan May LNG	Chan May LNG	2024	–	–	–	Speculative
	Vung Ang LNG	KG Electric Power Corp., PECC2, Siemens	2026	–	–	–	Speculative
	Hai Lang LNG	T&T Group, Hanwa, KOGAS, KOSPO	2026	1.5	2	160,000	U. Construction

LNG Export Plants

Country	Location/Project	Shareholders	Start up	Liquefaction		Storage	
				Trains	Nom. capacity (MTPA)	No. of tanks	Capacity m³
UAE	Das Island	ADNOC, Mitsui, BP, TotalEnergies	1977/1994	3	5.7	3	240,000
Algeria	Arzew	Sonatrach	1964-2014	13	20.8	6	920,000
	Skikda	Sonatrach	1980/2013	4	7.9	5	308,000
Angola	Soyo	Sonangol, Chevron, BP, Eni, TotalEnergies	2012	1	5.2	2	370,000
Australia	NWS LNG	BP, Chevron, MIMI, Shell, Woodside Energy, CNOOC	1989-2004	5	16.3	6	520,000
	Darwin LNG	Santos, Eni, INPEX, JERA, Tokyo Gas	2006	1	3.7	1	188,000
	Australia Pacific LNG	ConocoPhillips, Origin, Sinopec	2016	2	9.0	2	320,000
	Gladstone LNG	Santos, Petronas, TotalEnergies, KOGAS	2015-2016	2	7.8	2	280,000
	Gorgon LNG	Chevron, Shell, ExxonMobil, Osaka Gas, Tokyo Gas, JERA	2016-2017	3	15.6	2	360,000
	Pluto LNG	Woodside Energy, Kansai Electric, Tokyo Gas	2012	1	4.9	2	240,000
	Queensland C. LNG	Shell, CNOOC	2014	2	4.5	2	280,000
	Wheatstone LNG	Chevron, KUFPEC, Woodside Petroleum, Kyushu Electric Power Co., PEW	2017	2	8.9	2	300,000
	Ichthys LNG	INPEX, TotalEnergies, CPC, Tokyo Gas, Osaka Gas, Kansai Electric, JERA, Toho Gas	2018	2	8.9	2	330,000
	Prelude FLNG	Shell, INPEX, CPC, KOGAS	2018	1	3.6	6	228,000
Brunei	Brunei LNG	Gov. of Brunei, Shell, Mitsubishi	1972-74	5	7.2	3	195,000
Cameroon	Cameroon FLNG	Golar LNG	2018	4	2.4	1	125,000
Egypt	Damietta	Eni, EGAS, EGPC	2004	1	5.0	2	300,000
	Idku	EGPC, EGAS, Shell, Petronas, TotalEnergies	2005	1	7.2	2	280,000
Equ. Guinea	EG LNG	Marathon, Sonagas, Marubeni	2007	1	3.4	2	272,000
Indonesia	Bontang (E-H)	Pertamina, VICO, JILCO, TotalEnergies	1990-1998	4	11.5	5	635,000
	Dongi-Senoro	Medco Energi, Pertamina, Mitsubishi	2015	1	2.0	1	170,000
	Tangguh	BP, Mitsubishi, Inpex, CNOOC, JX Nippon, KG Mitsui, LNG Japan	2008-2023	3	11.4	2	340,000
Malaysia	Malaysia LNG	Petronas, Shell, Sarawak, Mitsubishi, Nippon Oil	1983-2016	9	29.3	6	445,000
	PFLNG Satu	Petronas	2016	1	1.2	4	177,000
	PFLNG Dua	Petronas	2020	1	1.5	4	177,000
Mozambique	Coral Sul FLNG	Eni, ExxonMobil, CNPC, GALP, KOGAS, ENH	2022	1	3.4	8	227,840
Nigeria	Bonny Island	NNPC, Shell, TotalEnergies, Eni	1999-2007	6	22.2	6	505,200
Norway	Snøhvit LNG	Equinor, TotalEnergies, Petoro, Neptune Energy, Wintershall DEA Norge	2007	1	4.2	2	250,000
Oman	Oman LNG	Oman Gov., Shell, TotalEnergies, Korea LNG, Mitsubishi, Mitsui, Partex O&G, Itochu Corp.	2000	3	10.4	4	480,000
Papua New Guinea	PNG LNG	ExxonMobil, Oil Search, Santos, JX Nippon Oil	2014	2	8.3	2	320,000
Peru	Pampa Melchorita	Hunt Oil, Shell, Marubeni, SK Group	2010	1	4.5	2	260,000
Qatar	Ras Laffan	QatarEnergy, Shell, ExxonMobil, TotalEnergies, ConocoPhillips et al.	1997-2010	14	77.4	18	2,340,000
Republic of the Congo	Congo FLNG Ph. I	Eni	2024	1	0.6	1	177,000
Russia	Sakhalin-2 LNG	Gazprom, Sakhalin Energy, Mitsubishi, Mitsui	2009	2	9.6	2	200,000
	Yamal LNG	Novatek, TotalEnergies, CNPC, Silk Road Investment Fund	2017-2019	3	17.4	4	640,000
	Portovaya LNG	Gazprom	2022	1	1.5	-	-
Trinidad & Tobago	Atlantic LNG	BP, Shell, NGC	1999-2005	4	15.3	4	640,000
USA	Sabine Pass LNG	Cheniere	2016-2022	6	30.0	5	800,000
	Corpus Christi LNG	Cheniere	2019-2021	3	15.0	3	480,000
	Freeport LNG	Freeport LNG, JERA, Osaka Gas	2019-2020	3	15.5	3	480,000
	Cameron LNG	Sempra, TotalEnergies, Mitsui, Mitsubishi	2019	3	15.0	3	480,000
	Calcasieu Pass LNG	VentureGlobal	2022-2023	18	11.3	2	440,000
	Cove Point LNG	BHE GT&S, Dominion Energy, Brookfield Asset Management	2017	1	5.3	7	695,000
	Elba Island LNG	Kinder Morgan, EIG Energy, Blackstone	2019-2020	10	2.5	5	560,000
Yemen	Balhaf LNG (Mothballed)	TotalEnergies, Hunt Oil, SK Innovation, Hyundai, KOGAS, Yemen Gas Corp., GASSP	2009	2	6.7	2	320,000

LNG Export Projects U. Construction

Country	Project	Project Developers	Planned Start Up	Number of Trains	Capacity In MTPA
Canada	LNG Canada	Shell, Petronas, PetroChina, Mitsubishi	2025	2	14
	Woodfibre LNG	Pacific Energy Corp., Enbridge	2027	2	2.2
Indonesia	Sengkang LNG	Energy World	2023+	4	2
Malaysia	ZLNG FLNG	Petronas	2027	1	2
Mauritania	Greater Tortue Ahmeyim FLNG	BP, Kosmos Energy	2024	–	2.52
Mexico	Costa Azul Export	Sempra Energy, TotalEnergies	2024	1	3.25
Mozambique	Mozambique LNG Ph. I	TotalEnergies, Mitsui, ONGC, ENH, PTTEP, Bharat Petroleum, Oil India	2024+	2	–
Nigeria	Nigeria LNG Expansion	Nigeria LNG	2024	1	8
Qatar	Ras Laffan Expansion I	QatarEnergy	2026	4	33
	Ras Laffan Expansion II	QatarEnergy	2027	2	16
Russia	Ust Luga LNG	RusKhimAlyans	2027	2	13
	Arctic LNG 2 T1	Novatek et al	2024+	1	6.6
United States	Golden Pass LNG T1-2	Golden Pass LNG	2024	2	12
	Golden Pass LNG T3	Golden Pass LNG	2025	1	6.03
	Corpus Christi LNG Stage 3	Cheniere Energy	2027	7	11.48
	Plaquemines LNG Ph. I	Venture Global	2024	1	10
	Plaquemines LNG Ph. II	Venture Global	2025	1	10

Future LNG Export Projects

Country	Project	Project Developers	Estimated Start Up	Number of Trains	Capacity In MTPA
Argentina	Vaca Muerta (YPF) LNG	YPF	2024+	–	5.37
Australia	Browse FLNG	Woodside Energy, Japan Australia LNG, Shell, BP, PetroChina	–	2	11.4
	Darwin LNG Life Extension	Santos, SK E&S, JERA, INPEX, Eni SpA, Tokyo Gas	2025	1	3.7
	Pluto LNG T2	Woodside Burrup Train 2A Pty Ltd., Global Infrastructure Partners	2026	1	5
Cameroon	Etinde FLNG	Perenco, Bowleven	2023+	–	1.3
Canada	Bear Head LNG	Bear Head LNG	2027	4	12
	Cedar FLNG	Haisla Nation, Pembina Pipeline Corp.	2027	–	3
	Energie Saguenay LNG	GNL Quebec	2026	2	11
	Ksi Lisims FLNG	Ksi Lisims LNG GP Ltd.	2027	–	12
	Placentia Bay FLNG	Horizon Maritime Services, LNG Newfoundland and Labrador Ltd.	2030	–	4
	Tilbury Island LNG T1	FortisBC	2026	1	0.9
	Tilbury Island LNG T2	FortisBC	2028	1	2.5
Equatorial Guinea	Fortuna FLNG	New Fortress Energy	–	1	–
Gabon	Boudji FLNG	Petronas	–	–	–
Guinea	Guinea LNG	West Africa LNG Group	2026+	1	–
Indonesia	Abadi FLNG	INPEX Masela Ltd.	2030	–	9.5
Israel	NewMed FLNG	NewMed Energy	2026	–	5
Mauritania	New Fortress Banda LNG	New Fortress Energy	2024	–	1.4
Mexico	Mexico Pacific LNG Ph. I	AECOM Capital, DKRW Energy	2025	2	9.4
	Mexico Pacific LNG Ph. II	AECOM Capital, DKRW Energy	2026+	1	4.7
	AMIGO LNG	Epsilon LNG, LNG Alliance	2026	1	4.2
	Vista Pacifico LNG	Sempra Energy	2025+	–	4
	Lakach FLNG	New Fortress Energy	–	1	1.4
	Altamira FLNG	New Fortress Energy	–	2	2.8
Mozambique	Rovuma LNG	Eni, ExxonMobil, CNPC, ENH, Galp, KOGAS	2025+	2	15.2
Nigeria	Brass LNG	Brass LNG Ltd.	–	2	10
	Greenville LNG	Greenville LNG	–	1	1.1
	UTM Offshore FLNG	UTM Offshore	2026	–	1.52
Papua New Guinea	Papua LNG	TotalEnergies, ExxonMobil, Papua New Guinea Gov., Santos	2027	2	5.4
	PNG LNG Expansion	ExxonMobil, Kumul Petroleum, Santos, JX Nippon O&G, MRDC	2025	1	2.6
Republic of the Congo	Congo FLNG Ph. II	Eni Congo	2025	1	2.4
Russia	Yakutia LNG	A-Property, Globaltek, Zhejiang Energy	2027	–	18
	Far East LNG I	ExxonMobil, SODECO, ONGC, Rosneft	2027+	1	6.2
	Far East LNG II	ExxonMobil, SODECO, ONGC, Rosneft	2035	1	10
	Vladivostok LNG	Gazprom, INPEX, Itochu Corp., JAPEX, Marubeni Corp.	2025	3	1.5
	Arctic LNG II	Novatek	2027	–	19.8
	Obsky LNG	Novatek	2026	–	6.6
	Chernomorsky LNG	Gazprom	2025	–	1.5
	Arctic LNG III	OOO Arctic LNG 3	2032	–	19.8
	Kara LNG	Rosneft	2030	–	30
Tanzania	Tanzania LNG	Equinor, ExxonMobil, Ophir Energy, Pavilion Energy, Shell, TPDC	2027	2	10
United Arab Emirates	Ruwais (ex Fujairah) LNG	ADNOC	2027+	2	6
United States	Fourchon LNG	Energy World	–	1	2
	Alaska LNG	Alaska Gasline Development Corp.	2030	3	20.1
	Cameron LNG Expansion	Cameron LNG LLC	2026	1	6.75
	Commonwealth LNG	Commonwealth LNG	2026	6	9.3
	Corpus Christi LNG Midscale Expansion	Cheniere Energy	2031	2	3.28
	Delfin FLNG	Delfin LNG LLC	2026+	4	12
	Driftwood LNG T1-5	Tellurian	–	5	27.6
	Freeport LNG Expansion	Freeport LNG Dev.	2026	1	5.1
	Gulf LNG	KinderMorgan	–	2	10.86
	Lake Charles LNG	Energy Transfer	2026+	3	17.79
	Magnolia LNG	Glenfarne Group	–	4	8.8
	Port Arthur LNG Ph. I	PALNG Common Facilities Co., Port Arthur LNG, LLC	–	2	13.5
	Port Arthur LNG Ph. II	PALNG Common Facilities Co., Port Arthur LNG, LLC	–	2	13.5
	Texas LNG	Glenfarne Energy Transition	2027	2	4
	Rio Grande LNG Ph. I	NextDecade	2026	2	10.8
	Rio Grande LNG Ph. II	NextDecade	–	3	16.2
	Pointe LNG	Pointe LNG, Pointe Pipeline Co.	2026	3	6
	Repauno Works LNG	Delaware River Partners LLC	–	–	1.5
	Qilak LNG	Qilak Energy	2026	–	4
	CP2 LNG Ph. I	Venture Global	2026+	9	10
	CP2 LNG Ph. II	Venture Global	2027+	9	10
	Delta LNG Ph. I	Venture Global	2028+	–	10
	Delta LNG Ph. II	Venture Global	2029+	–	10
	West Delta LNG Deepwater Port	LNG21 Group	2026+	6	6.1
	Grand Isle FLNG	New Fortress Energy	2025+	–	2.8



EXHIBITION & CONFERENCE

GEORGE R BROWN CONVENTION CENTER | HOUSTON | 17-20 SEPTEMBER 2024

Co-Hosts:



Gastech Houston 2024

Transforming energy through
vision, innovation and action

BOOK A
DELEGATE
PASS



Strategic Conference



Technical & Commercial
Conference

Organized by:

dmg::events

gastchevent.com @gastchevent #Gastech