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The Crown LNG value chain

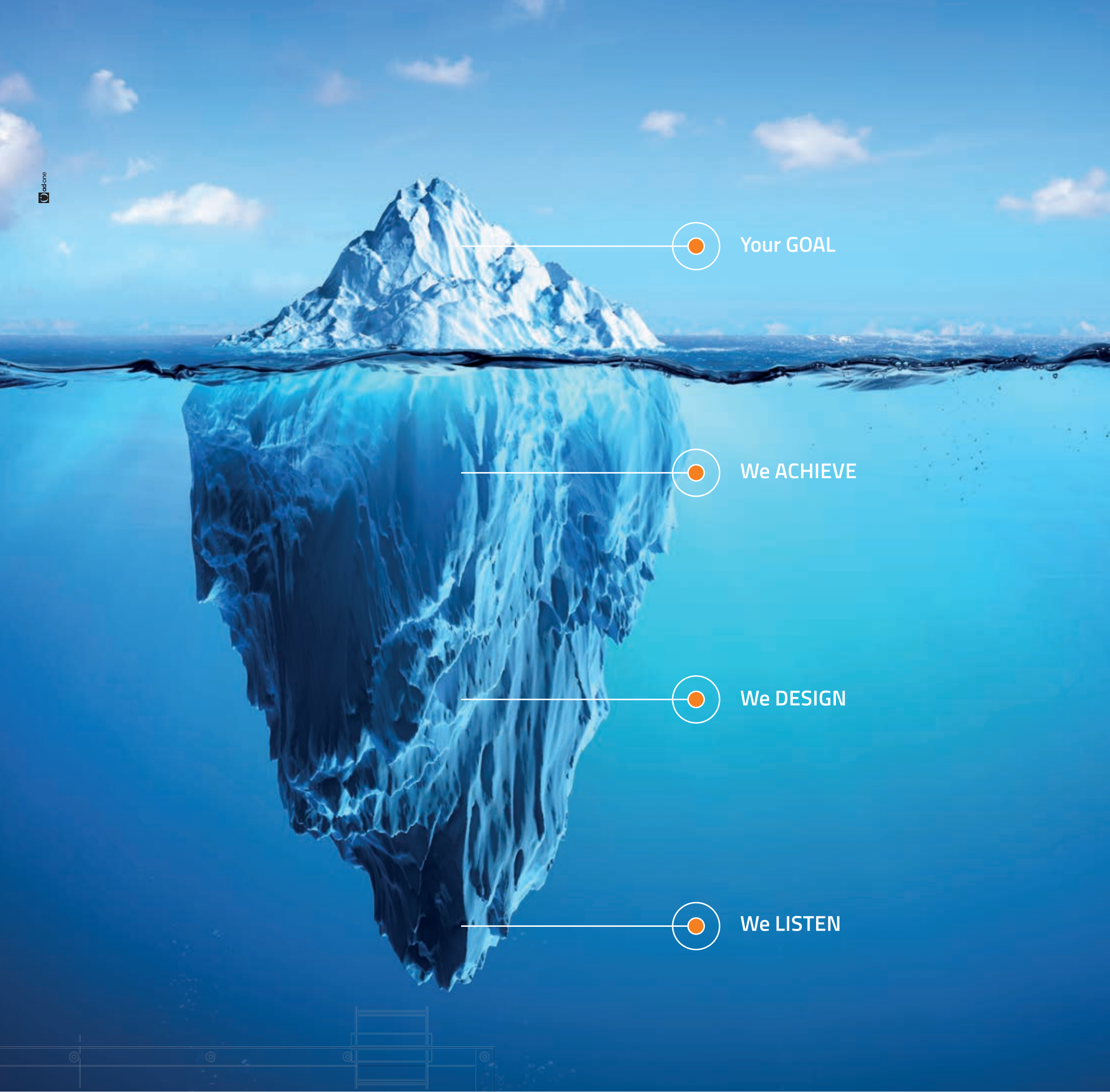


Licensed capacity  
7.2 MTPA

Capacity under permitting  
5.0 MTPA

Future capacity  
+15.0 MTPA





The image features a large iceberg floating in a blue ocean under a clear sky. The iceberg is divided into four horizontal sections, each with a white line pointing to a label on the right. The top section is above the water line, while the other three are submerged. The labels are: 'Your GOAL' (top, above water), 'We ACHIEVE' (second, just below water), 'We DESIGN' (third, deeper), and 'We LISTEN' (bottom, deepest). The submerged portion of the iceberg is significantly larger than the visible tip.

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## Crown LNG: Innovative bet on India's LNG Future

*As Crown LNG forges ahead with its reinterpretation of the proven GBS technology, it seeks to inject fresh impetus into the LNG infrastructure landscape, our Market Editor Dr Alexander Wilk reports.*

Crown LNG, an LNG infrastructure company founded in 2016 by former industry colleagues, has placed a solid bet on the future prosperity of the small(er) scale LNG sector. The company's approach focuses on using gravity-based structures (GBS) for LNG terminals in challenging environments, addressing a critical need in the industry for robust infrastructure solutions.

The vision of Crown LNG's helm, CEO Swapan Kataria, extends beyond conventional LNG infrastructure. Kataria's enthusiasm for GBS technology is rooted in its potential to overcome limitations faced by traditional floating and land-based LNG import solutions. The GBS design, essentially a concrete structure that sinks to the seabed once filled with ballast, offers a unique solution for both LNG production and regasification in locations previously deemed unsuitable.

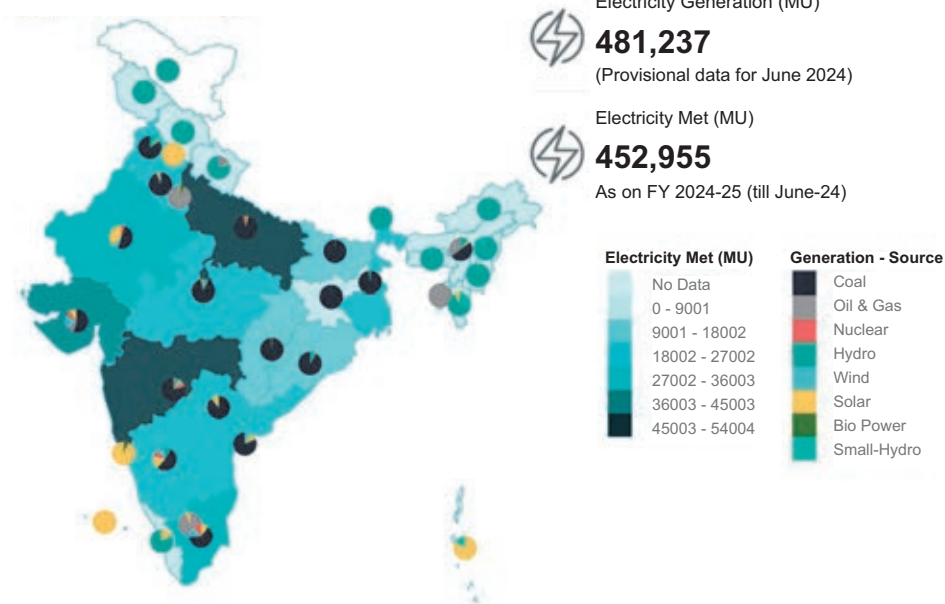
Crown LNG's flagship project, a US\$1bln, 7.2mtpa GBS regasification unit (GBSRU) planned for Kakinada on the coast of India's eastern state of West Bengal, serves as a prime example of the company's unusual approach. The choice of Kakinada was strategic, driven by challenging conditions that include prohibitively high dredging costs in the face of insufficient draught for conventional FSRUs as well as monsoon-driven weather.

### Succeed where others failed

The Kakinada GBSRU will be situated 19 kilometres offshore in 20 metres of water, connected to India's onshore pipeline grid via a subsea connector. This ambitious project aims to succeed where a previous FSRU attempt failed, highlighting the potential advantages of GBS technology in difficult environments. The facility is

### India's Energy Economy

Source: Government of India



designed to incorporate proven technologies, including GTT tanks, Siemens gas turbines and Wartsila regasification equipment to maximise Crown's on-site maintenance capabilities. The GBSRU's concrete structure has been designed by Norwegian offshore engineering and GBS specialist Aker, which has been responsible for implementing record-breaking floating concrete platforms in the North- and Norwegian Seas such as Troll.

Notably, the GBSRU's design convinced Indian authorities to grant the Kakinada facility a 365-day operational approval, a significant improvement over previous conventional floating solutions, which were only granted licenses for 270 days of operation due to wave constraints. The GBSRU's year-round operability is based on enhanced safety due to its structural stability and minimal land footprint. Crown LNG is keen to highlight that safety concerns in the face of harsh weather conditions and natural calamities have been thoroughly addressed in the design process. Aker's engineering team has incorporated

substantial safety margins based on historical data of typhoons, hurricanes, and wave heights in the region. Once operational, the floating structure will position the Kakinada terminal as a game-changer in the Indian LNG market.

To date, India has been entirely supplied via substantial conventional, onshore import terminals led by the Dahej facility in southern Gujarat. According to our data, Dahej has historically been the import node for more than half of India's LNG imports. Other leading terminals in historic volume terms on India's western coast include the Shell-controlled Hazira terminal and the Dabhol facility. Meanwhile, on the eastern coast, there are the comparatively new Ennore, Dhamra and Chhara LNG terminals. However, floating terminals are notably absent in India. This is unusual when considering the country's regional peers – Pakistan, Bangladesh, Malaysia and Indonesia – all offtake substantial shares (if not all) of their LNG imports via FSRUs. This is not for want of trying. For example, as we have reported previously, our data shows





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**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  
iancochran74@gmail.com

**Fuelling Editor**  
Malcolm Ramsay  
malcolmraysay@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

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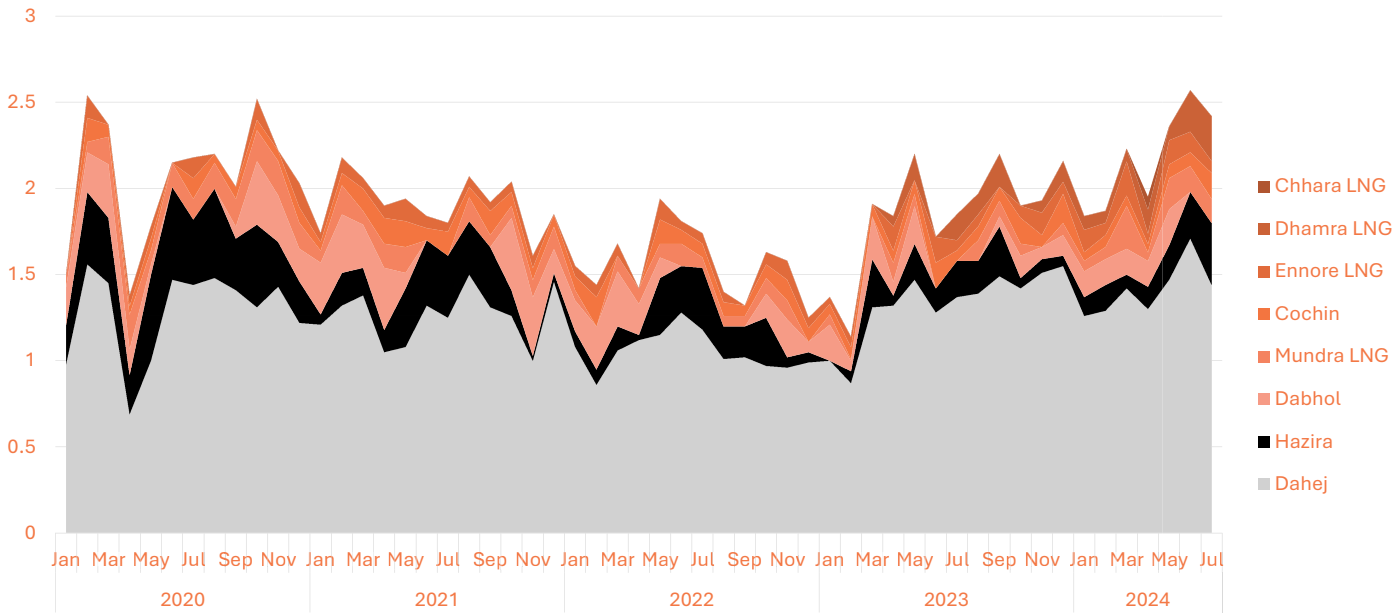
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Indian LNG Demand (MMt)



Source: LNG Journal, Spire Global AIS

H-Energy was repeatedly unsuccessful to import LNG via its Jaigarh FSRU terminal in Maharashtra State even as it had secured two successive FSRUs, the Cape Ann and the Höegh Giant.

Strategic importance

The strategic importance of Crown’s Kakinada GBSRU extends beyond its technological innovations. As the only prospective independent LNG import facility India’s northeastern coast, it is connected to the East-West connector and thus the national grid. It thereby is in a prime position to act as a regional hub. This connectivity, combined with the Indian government’s significant investments in gas pipeline grid expansion over the past decade, positions Crown LNG to play an important role in India’s energy future.

Whilst Kataria emphasised that Crown LNG’s role in India would always be grounded in providing regasification services, which eliminates his company’s commodity price risks, he told the LNG Journal the company is also pursuing local product and services integration for long-term stability and profitability. This includes local bunkering and regional small-scale supply as part of a centre-and-spoke approach, focusing on the wider Kolkata area. The company is also open to strategic investments from experienced players in the gas and LNG terminal operations sector.

The timing of Crown LNG’s entry into the Indian market is opportune. The project’s final investment decision (FID) is now expected by August 2025, with construction to begin in January 2026 and commissioning due in 2028. To date,

Indian power generation has been heavily reliant on coal, latest government data shows, with almost 75 percent of electricity produced with the fuel.

However, the Indian government has set an ambitious goal of almost doubling the share of gas in the country’s energy mix from 8.9 percent in 2023 to 15 percent by 2030. At the time of writing, India was on track to see full-year LNG demand of around 26mmt, our data indicated. Total offtakes in 1H 2024 stood at 12.82mmt, up 2.64mmt (26 percent) year-on-year. In view of current demand, therefore, gas at 15 percent of India’s energy mix could represent roughly 44mtpa of annual LNG imports by 2030. In line with that growth target, the Indian government has made substantial investments in national gas pipeline grid expansion and committed to maintain the momentum via, inter alia, government grants.

With more than 100mtpa of new LNG supply capacity expected to come online by 2030 – which, as Kataria highlights, “will need a home” – Crown LNG is well-positioned to help feed this growing demand. The company is seeking to supply gas to replace coal in power generation, especially in view of over 50 GW of coal-based power capacity currently needed to meet the country’s on-demand power requirements.

Following on from central government’s climate commitments as well as their own carbon emissions reduction targets, India’s industrial and petrochemical sectors are increasingly seeking to reduce their carbon footprint. According to Kataria, Crown LNG found during discussions with prospective offtakers

that the supply flexibility it can offer is perfectly aligned with these sustainability goals. The GBSRU’s pipeline connector surfaces in the vicinity of large steel, cement, petrochemical and fertilizer plants. To date, coal has been their only maintainable fuel option. Offtake by city-gas aggregators is also on the books.

Crown LNG plans to offer roughly 6.1mtpa of regasification capacity, comprising a mix of long-term and medium-term contracts, while reserving 15 percent for spot and short-term cargoes. Crown currently has an import license for 7.2mtpa in India. Speaking to the LNG Journal, Kataria also confirmed that apart from domestic industry, international players who wanting access to Indian gas market are also part of Crown LNG’s target audience.

Achilles heel

Notably, LNG prices and not structural demand are the Achilles heel of India’s LNG market growth, our LNG flow data and landed spot prices logged by the Multi Commodity Exchange of India indicate. For example, India’s vast agricultural sector is heavily dependent on domestic fertiliser production. However, feedgas comprises the lion’s share in fertiliser production cost, leading to swift fuel switching once prices rise. Most of India’s urea plants are near the country’s major coal producing provinces. India’s LNG demand thus came under significant pressure as spot prices rose sharply on account of the European demand vortex in 2022-2023. During the same period, India’s coal production jumped by 114.98 million tonnes (15 percent) to 893 million



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Spot LNG Prices: Hazira (US\$/mmBtu)



Source: MCX, INR-USD conversion via LNG Journal calculations

tonnes, according to data by India’s Ministry of Coal.

Indian importers traditionally did not hedge LNG prices through long-term contracts and were thus immediately exposed to much of the steep price increase.

Template made in India

Although the Rovigo Adriatic LNG terminal offshore south of Venice in Italy was the first project to deploy a GBS facility to import LNG, Crown is keen to roll out its version to as many harsh weather locations as possible. With global demand for LNG anticipated to increase by more than 60 percent by 2030, additional new facilities for both the export and import of LNG are needed over the next decade, many of which will need to be located in geographies prone to extreme weather events.

Moreover, in our view, by not relying on FSRU conversions or newbuilds, the concept allows for the sidestepping of either a tight market for conversion candidates among older LNG carriers or very expensive newbuilds. In the case of the Kakinada GBSRU, the comparatively simple concept of a GBS allows the structure to be constructed at an Indian shipyard instead of a specialised outfit in South Korea or China, thus promising to reduce costs whilst strengthening the local economy.

Crown thus sees its GBS approach for offshore LNG facilities able to significantly reduce impacts and downtime resulting from extreme weather, offering a robust solution to this pressing industry challenge. In an

investor presentation, Crown LNG highlighted it had identified approximately 20 global locations suitable for GBS LNG terminals where conventional options are not feasible.

Accordingly, Kataria has outlined an ambitious roadmap encompassing the deployment of Crown’s GBS designs to regasification, liquefaction and integrated power plants, ultimately culminating in green hydrogen and green ammonia conversion. Whilst the Kakinada GBSRU is set to constitute Crown LNG’s focus until commissioned, it is also exploring potential GBS projects in the harsh-weather regions of Vietnam (two typhoon seasons) and Canada (rough seas). Following the Kakinada GBSRU’s completion, there is also potential to swiftly apply the proven concept to a second unit close to the India-Bangladesh border to enhance Kakinada’s hub leverage.

To propel its ambitious growth plans, Crown LNG has taken bold steps to raise capital. The company has merged with Catcha Investment, a publicly traded special purpose acquisition company. This merger resulted in Crown becoming a NASDAQ-listed company named Crown LNG Holdings Limited. The capital raised will further strengthen Crown LNG’s ability to execute on its diversified project pipeline across multiple global markets.

Scotland

While the Kakinada project is Crown LNG’s flagship venture, the company’s ambitions extend far beyond India. Crown LNG is simultaneously developing a conventional FSRU for Grangemouth in

Scotland. For the US\$533 million, 5mtpa Grangemouth project, the company has entered into an exclusivity agreement for the use of the proposed offshore site on the Forth River, and a site study for the deepwater port with LNG vessel access has been completed. The company has begun the consenting process with the Scottish Government and will employ FSRU technology for this project. The project targets implementation by 2027, with existing power and gas grid access available within ten miles of the envisioned site.

The company has selected IKM Engineering & Environmental Consultants as its partner for design, engineering, and project management, marking a crucial step towards the Final

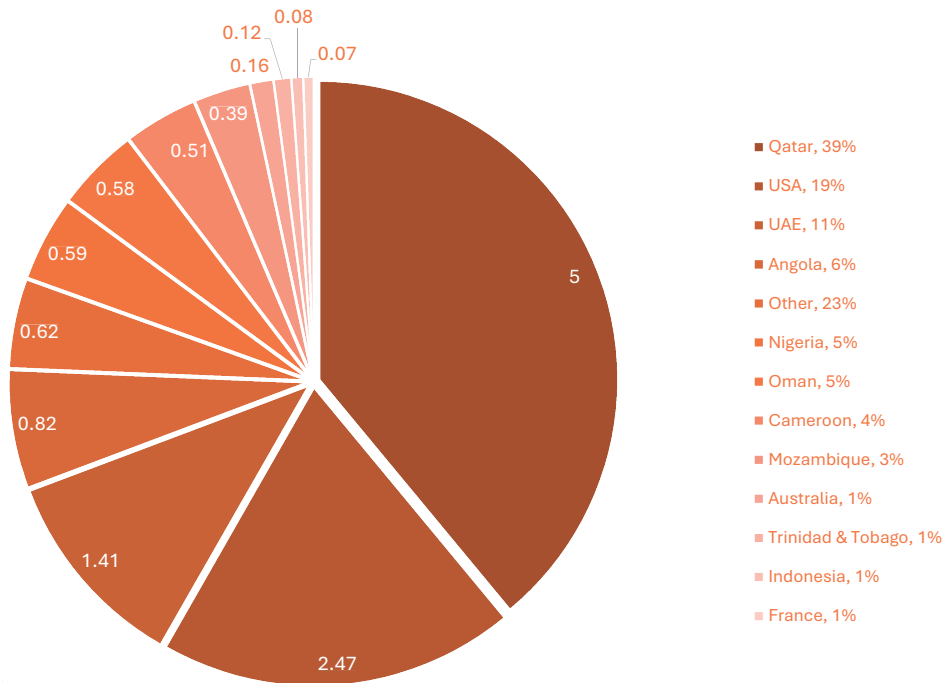
Investment Decision. IKM will handle pre-FEED and FEED phases, including consenting, process design, facility layout optimisation, detailed engineering, and procurement support. A site study has been completed, and Crown will immediately begin the consenting process with Scottish and UK governments.

Kataria has emphasised the project’s significance for the UK’s energy security and the Scottish economy. Speaking to the LNG Journal, he noted that approximately 4GW of Scottish power capacity derived from two nuclear power plants – Hunterston in North Ayrshire and Torness in East Lothian – will ultimately be lost due to Torness’ shut down by 2028. North Ayrshire has already been closed since 2022 due to safety concerns. The development aligns with the ongoing transition to a low-carbon economy and coincides with the new Labour government’s plans for a state-owned company, Great British Energy.

Concluding thoughts

As Crown LNG forges ahead with its reinterpretation of the proven GBS technology, it seeks to inject fresh impetus into the LNG infrastructure landscape. Its GBS solutions to infrastructure challenges in harsh environments aligning its ambitious expansion plans with national energy goals in markets like India, Vietnam and Canada. Looking ahead to the future of energy with its multi-generational technology roadmap, Crown LNG is placing an LNG bet on the future whilst also contributing to define it as a world still dominated by coal continues its transition towards cleaner energy sources.

India's LNG Sources, MMt (1H 2024)



Source: LNG Journal





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# Germany's LNG infrastructure requires long-term thinking

*Germany has built critical infrastructure to support short-term LNG capacity and champion local demand. But questions are now being raised about the viability of such facilities as the country is looking to hydrogen for the long-term. The Hanseatic Energy Hub is hence designed to be H<sub>2</sub> and ammonia-ready from the get-go; our Markets Editor Anja Karl was told.*

Germany has been ramping up its LNG import capacity at near record speed over the past two-and-a-half years as it looks to shore up its energy security after Gazprom effectively halted Russian pipeline gas supplies in reaction to western sanctions over the Kremlin's war in Ukraine.

A total of 1.8 bcf/d of LNG regasification capacity was added in 2023, with another 1.6 bcf/d due to be built by the end of 2024 notably at terminals in Brunsbüttel, Lubmin and Wilhelmshaven. By comparison, Belgium, Cyprus, Greece, Poland and the Netherlands are expected to add a combined 3.2 bcf/d over the same period.

Up until the end of 2022, natural gas was only imported to Germany via pipelines, with more than 5,000 petajoules (PJ) of pipeline gas imported in 2021, a total that then dropped by about 30 percent to just 3,524 PJ. It hence became paramount for Germany to be capable of receiving LNG carriers to source non-Russian gas from markets like the Middle East and the United States. It has been playing catch-up since then, with 15 import terminals now planned, under construction or fully operational. Chancellor Olaf Scholz has described this race as "new Germany speed", with LNG seen as a transitional fuel, as the country seeks to shift to renewables and



Render of Hanseatic Energy Hub

hydrogen, aspiring to become greenhouse gas neutral by 2045.

## LNG seen as a mainstay fuel

McKinsey believes LNG will remain an important part of Germany's power and energy supply for the next decade, as expansion of renewable energy and electricity grid is lagging behind schedule. Statista figures show that by the end of 2023, 15.5 percent of Germany's power mix was made up of LNG while 52 percent was coming from renewable sources. That figure rose to 58 percent in the first half of 2024, as reported by the German federation of energy and water industries (BDEW). The speed at which the necessary infrastructure is being developed has prompted BDEW head Kerstin Andreae to note that the bridge to renewable energy could become shorter and crossed faster.

"We do not expect to see a major decline in LNG demand anytime soon," says Thies Holm, Managing Director of GAC Germany, which set up a new office in the Port of Stade outside of Hamburg in December 2023 to provide ship agency and logistics services for LNG vessels, FSRUs and tankers calling at the port to ensure they can dock, unload cargo and turnaround effectively. "The government

seeks to reduce the country's carbon footprint but current LNG demand remains stable, not least due to the impact of the winter seasons on demand. It will take time for households and industry in Germany to switch from LNG to greener fuel options, so we must do what we can today to shore up our LNG capacity."

## Land-based Stade terminal preceded by FSRU

The Hanseatic Energy Hub, based out of the Port of Stade on the River Elbe, is one Germany's newest LNG facilities supporting the transition to more sustainable fuel options. When it formally begins operations in 2027, built by Técnicas Reunidas and based on an investment of more than €1.6 billion (\$1.7 billion), it will be Germany's first land-based LNG terminal and offers a total capacity of 13.3 bcm to help meet more than 50 percent of the country's existing LNG demand. The two utilities EnBW and SEFE have booked capacities of 6 bcm and 4 bcm, respectively, at the Stade LNG

terminal, while the Czech energy company CEZ secured long-term import rights for 2 Bcm per annum.

Even before the land-based terminal is up and running, the Port of Stade is also a crucial location for Germany's regasification capabilities. In March 2024, it became home to the FSRU *Energos Force*, the first floating storage and regas unit in Stade and the fourth nationwide, to shore up its LNG

*"We do not expect to see a major decline in LNG demand anytime soon"*

import capabilities until all of Germany's planned terminals are operational. The total regasification capacity of Germany's terminals, once



Thies Holm, Managing Director, GAC Germany





**Boarding officer looking at Arctic Princess LNG tanker**

all of the planned facilities are fully operational, will rise from 13.5 bcm in 2023 to 54 bcm by the time the Hanseatic Energy Hub comes online in 2027 which will substantially alter the country's supply balance.

### Most LNG cargoes to be shipped from the US

"It is not yet clear when the FSRU *Energos Force* will be hooked up to the grid and when the first cargo will be received," says Holm. "We understand that when imports do kick start, they will most likely come from the United States and shipped on freight on board terms. This is also subject to who wins the discharge slots for such cargoes and, right now, more than 90 percent of the volumes are coming from across the Atlantic."

Yet, despite a rapid build-out of LNG regas capacity, the intake of cargoes has so far been slow moving, as German gas demand fell more than 18 percent from 648 TWh in 2021-22 to 531 TWh in 2022-23. This gives ground for concerns about overcapacity as both Germany and its neighbours develop their LNG infrastructure. According to data from the Institute for Energy Economics and Financial Analysis, the continent is expected to develop a total LNG terminal capacity of more than 400 bcm by 2030 – while forecast demand is unlikely to exceed 190 bcm during that period, hence more than half of the LNG

infrastructure assets could be redundant.

An internal report by the German Ministry of Economic Affairs noted that the "capacity of available FSRUs and land-based terminals would exceed the level of the 2021 gas import volumes from Russia". FSRUs alone would provide up to 67 bcm by 2024, while the fixed onshore terminals could add a further 53 bcm by 2026. All this, at a time when German

demand for LNG is expected to decline from 90 bcm in 2022 to 70 bcm by 2030 and 20 bcm by 2040.

### Terminals ready for shift to hydrogen

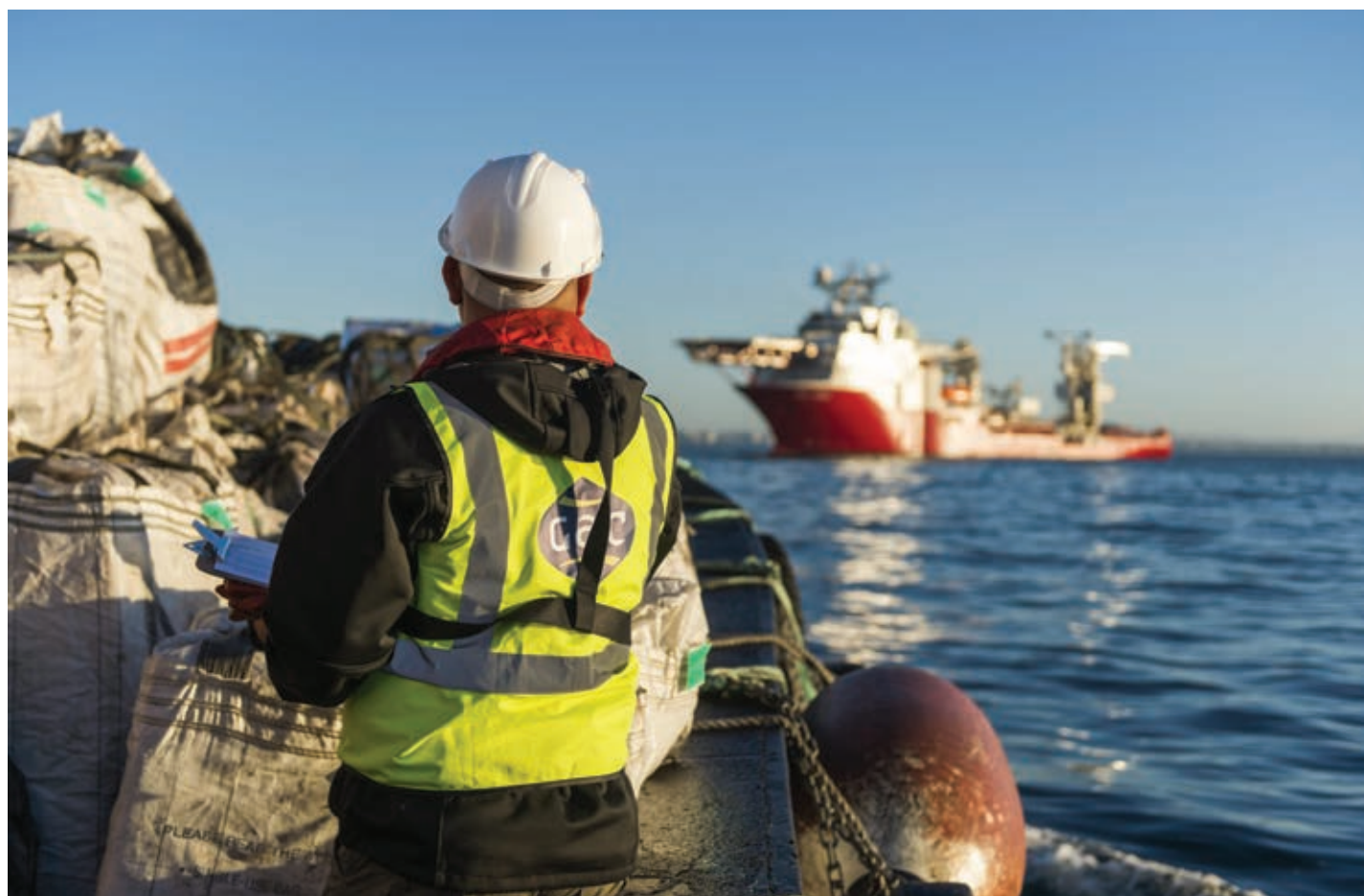
Countering criticism that Germany's LNG infrastructure plans could be "massively oversized", industry has already put plans in place to ensure the facilities have a long-term future. To alleviate concerns

about overcapacity, while shoring up energy security, the LNG Acceleration Act (LNGG) passed in July 2023 requires new and existing LNG terminals to be hydrogen-ready by 2043.

Germany's expected demand for hydrogen is set to grow from 55 TWh per year in 2023 to 350 TWh in 2045, which will naturally result in a decline in LNG imports. In anticipation of the risks, the Hanseatic Energy Hub has already been declared hydrogen and ammonia-ready, both technically and commercially, once it comes online in 2027. The facility is being designed with low-carbon energy sources in mind, such as bio-LNG and synthetic natural gas. Hanseatic is also being touted as a major ammonia import facility that can convert to hydrogen for domestic use.

But in the face of renewables build-out, utilities are bracing for decline of long-term LNG imports and capacity. "A decline in LNG capacity in Germany should be expected over the next 10 years, particularly as greener alternatives become available, so it is important that existing storage capacities can be repurposed for other forms of energy to aid our transition or improve our regasification capabilities," says Holm.

"The shift the hydrogen is very much on the table. Germany's ambition to produce a significant amount of climate-friendly energy through its National Hydrogen Strategy remains on track. But for now, the focus is firmly on LNG and getting its facilities online." ■



**Ship supply launch approaching Multi-Purpose offshore vessel**



# Global LNG trade grows modestly in July

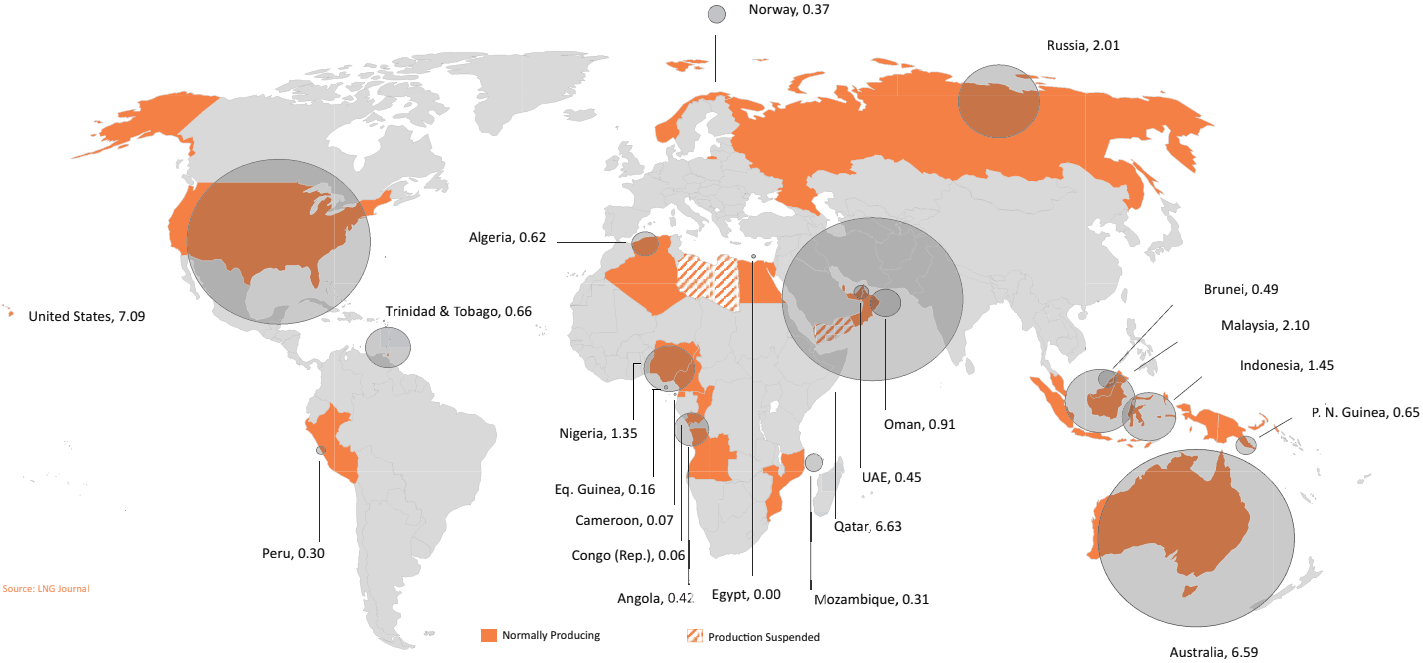
Our July data showed modest LNG output growth globally although exports were down year-on-year. Meanwhile, net demand continued to strengthen, our Market Editor Dr Alexander Wilk reports.

Global LNG exports in July remained largely steady with only a marginal increase of 0.14mmt to 32.69mmt from 32.55 in June. However, this was down 1.41mmt (-4 percent) from the 34.10mmt we recorded in July 2023. Qatar and Australia, two of the three most significant exporters, saw gains. Qatar's shipments rose substantially by 0.63mmt (10 percent) to 6.63mmt, whilst Australia recorded a slight uptick of 0.11mmt (2 percent) to 6.59mmt. In contrast, the United States experienced a decline in exports, down by 0.38mmt (-5 percent) to 7.11mmt, primarily due to lower performance at Freeport LNG.

Middle Eastern LNG exports grew by 0.48mmt (6 percent) to 7.99mmt, largely driven by Qatar's increased exports to the Pacific Basin. Concurrently, West African LNG flows increased slightly in volume terms, whilst North African and other Atlantic Basin flows saw a net reduction.

On the demand side, global LNG imports increased by 1.80mmt (6 percent) to 32.84mmt, primarily driven by growth in the Pacific Basin and Middle East.

Global LNG Exports (MMt)  
July 2024



Notably, Far Eastern demand grew by 1.30mmt (8 percent) to 17.21mmt, underpinned by increases in Japan and China. China led global LNG imports with 6.32mmt, an increase of 0.44mmt (8 percent) month-on-month. Japan followed

suit, boosting its imports by 0.78mmt (17 percent) to reach 5.50mmt. However, South Korea reduced its imports by 0.06mmt (-2 percent) to 3.38mmt.

Middle Eastern LNG demand also saw significant growth, increasing by 0.79mmt (50 percent) to 2.37mmt, with notable increases in Kuwait, Pakistan, and Egypt.

In contrast to the Pacific and Middle East, however, Atlantic Basin demand decreased by 0.32mmt (-4 percent) to 7.48mmt, mainly due to reduced European imports. European demand saw significant decreases in countries such as France, Germany, and the Netherlands, which were only partially offset by comparatively modest increases in Spain, Turkey, Italy and the Caribbean.

## Pacific Basin

Our data at the time of writing showed Pacific exports reached 12.18mmt in July, coming in slightly above June's full-month volume of 12.06mmt by 0.12mmt (1 percent). Consequently, annualised capacity utilisation stood at 79 percent for the month. Exports were nevertheless down by 0.14mmt (-1 percent) year-on-year.

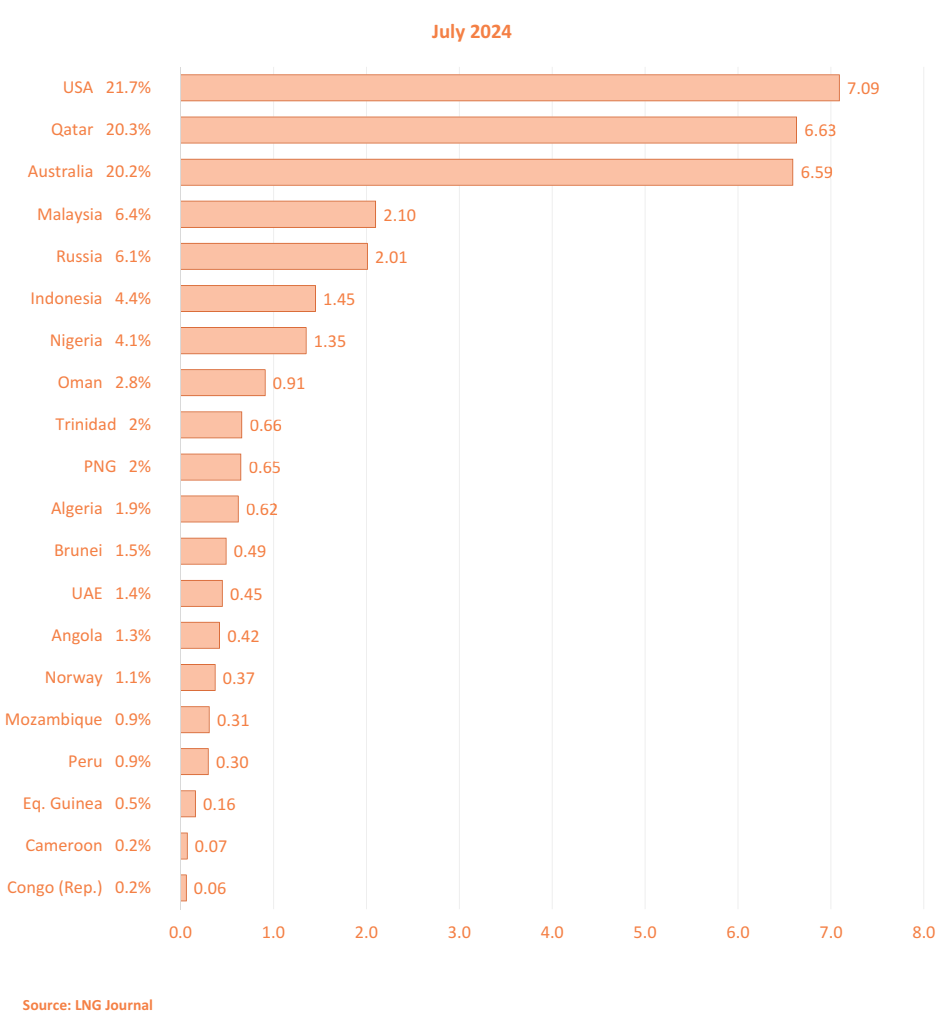
The Pacific Basin's most significant exporter by installed capacity – Australia – saw a slight increase in shipped volumes of 0.11mmt (2 percent) to 6.59mmt in July from 6.48mmt in June.

Wheatstone LNG experienced a significant increase of 0.21mmt (32 percent) with 0.86mmt in shipments compared to 0.65mmt in June, while NWS LNG also saw a substantial rise of 0.20mmt (21 percent) with 1.17mmt in shipments compared to 0.97mmt in June. Australia Pacific LNG had a considerable increase of 0.10mmt (14 percent) with 0.81mmt in shipments compared to 0.71mmt in June, and Gladstone LNG followed suit with a 0.04mmt (11 percent) increase, shipping 0.41mmt compared to 0.37mmt in June. Additionally, Prelude FLNG saw a notable increase of 0.03mmt (11 percent) with 0.30mmt in shipments compared to 0.27mmt in June.

However, these increases were tempered by export decreases amounting to 0.47mmt across four facilities. Pluto LNG faced a decline of 0.02mmt (-5 percent) with 0.41mmt in shipments compared to 0.43mmt in June, while Queensland Curtis LNG experienced a larger drop of 0.08mmt (-10 percent) with 0.73mmt in shipments compared to 0.81mmt in June. Ichthys LNG saw a more significant decline of 0.12mmt (-15 percent) with 0.66mmt in shipments compared to 0.78mmt in June, and Gorgon LNG faced the largest decrease of 0.25mmt (-17 percent) with 1.24mmt in shipments compared to 1.49mmt in June.

Australian exports were led by shipments to Japan, which grew imports

Market Share & LNG Exports by Country (MMt)



Source: LNG Journal





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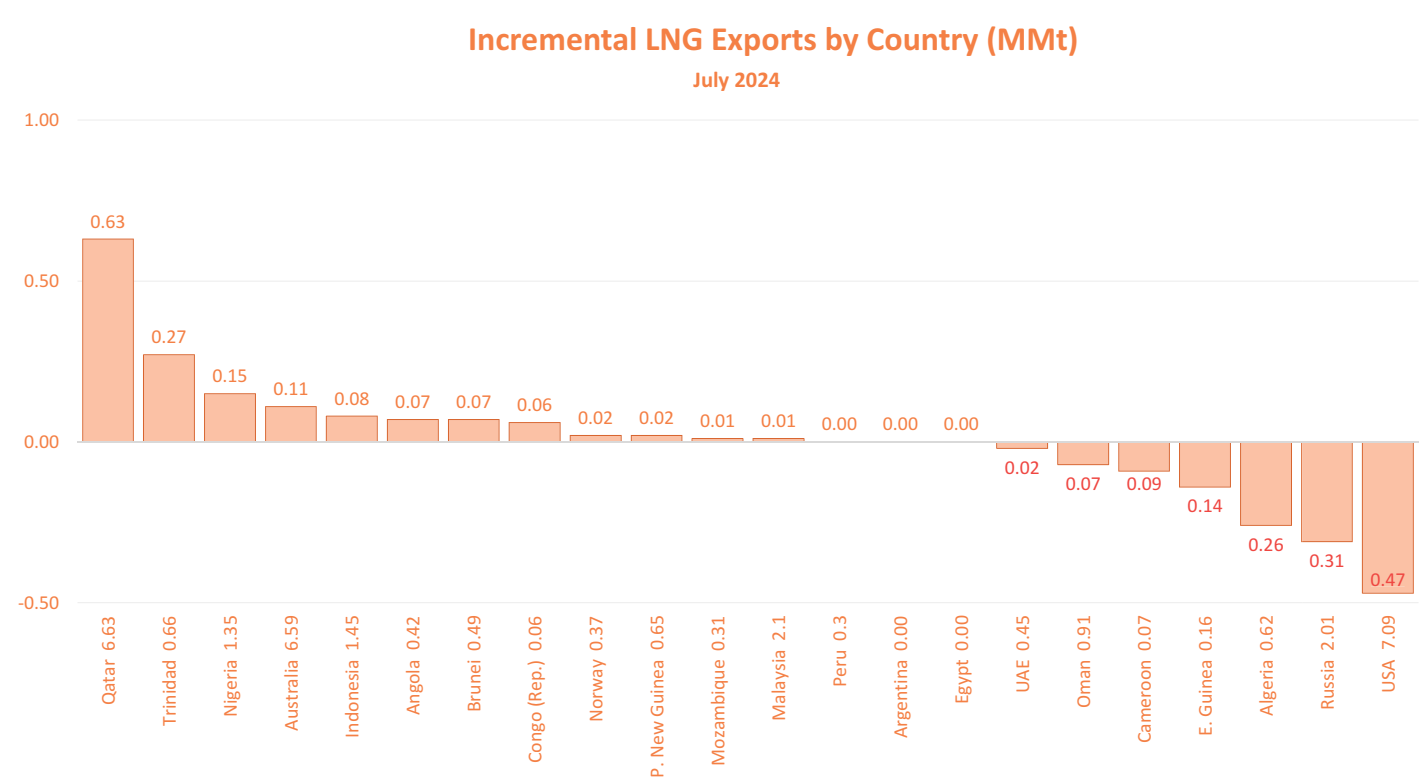


by 0.10mmt (5 percent) month-on-month to 2.28mmt in July. Concurrently, South Korea significantly increased imports from Australia by 0.23mmt (34 percent) to 0.91mmt alongside an increase of Australian exports to Taiwan by 0.05mmt (7 percent) to 0.78mmt. Singapore followed suit with a 0.04mmt (21 percent) increase to 0.23mmt. China, however, cut its Australian imports by 0.38mmt (-17 percent) to 1.81mmt from 2.19mmt in June.

**Southeast Asia :** North of Australia, PNG LNG recorded a production increase of 0.02mmt to 0.65mmt in July, up by 3 percent compared from 0.63mmt in June. The plant's annualised capacity utilisation rate thus stood at 94 percent. PNG exports were led by shipments to Japan, which increased imports significantly by 0.16mmt (89 percent) month-on-month to 0.34mmt in July.

Indonesia, meanwhile, boosted exports by 0.08mmt (6 percent) to 1.45mmt in July compared to 1.37mmt in June. Tangguh saw a significant increase of 0.18mmt (20 percent) with 1.09mmt in shipments compared to 0.91mmt in June. These increases were tempered, however, by export decreases at Bontang and Donggi-Senoro LNG, whereby the former cut shipments by 0.04mmt (-14 percent) to 0.24mmt from 0.28mmt in June, whilst the latter saw a month-on-month reduction of 0.06mmt (-33 percent) to 0.12mmt from 0.18mmt. China and Japan underpinned Indonesia's export growth, with China boosting imports by 171 percent to 0.38mmt and Japan's offtakes increasing by 40 percent to 0.28mmt.

Concurrently, Malaysia saw exports



Source: LNG Journal

remain broadly steady with only marginal month-on-month increase of 0.01mmt to 2.10mmt. Malaysia LNG achieved a substantial export increase of 0.21mmt (12 percent) to 2.03mmt from 1.82mmt in June, but which was offset by PFLNG 2's market absence following flows of 0.21mmt in June. Accordingly, month-on-month growth solely derived from PFLNG 1's export increase by 0.01mmt (17 percent) to 0.07mmt.

Malaysian exports were primarily directed to China and Japan, amounting to 0.70mmt, respectively, in July. Whilst China had nonetheless curtailed its Malaysian imports by 0.11mmt, Japan maintained import levels. However, South Korea also reduced its imports by

0.06mmt to 0.38mmt and Thailand halved its offtakes to 0.07mmt. As such, month-on-month growth in Malaysian imports was only seen in Taiwan, where offtakes amounted to 0.20mmt following no such imports the week prior.

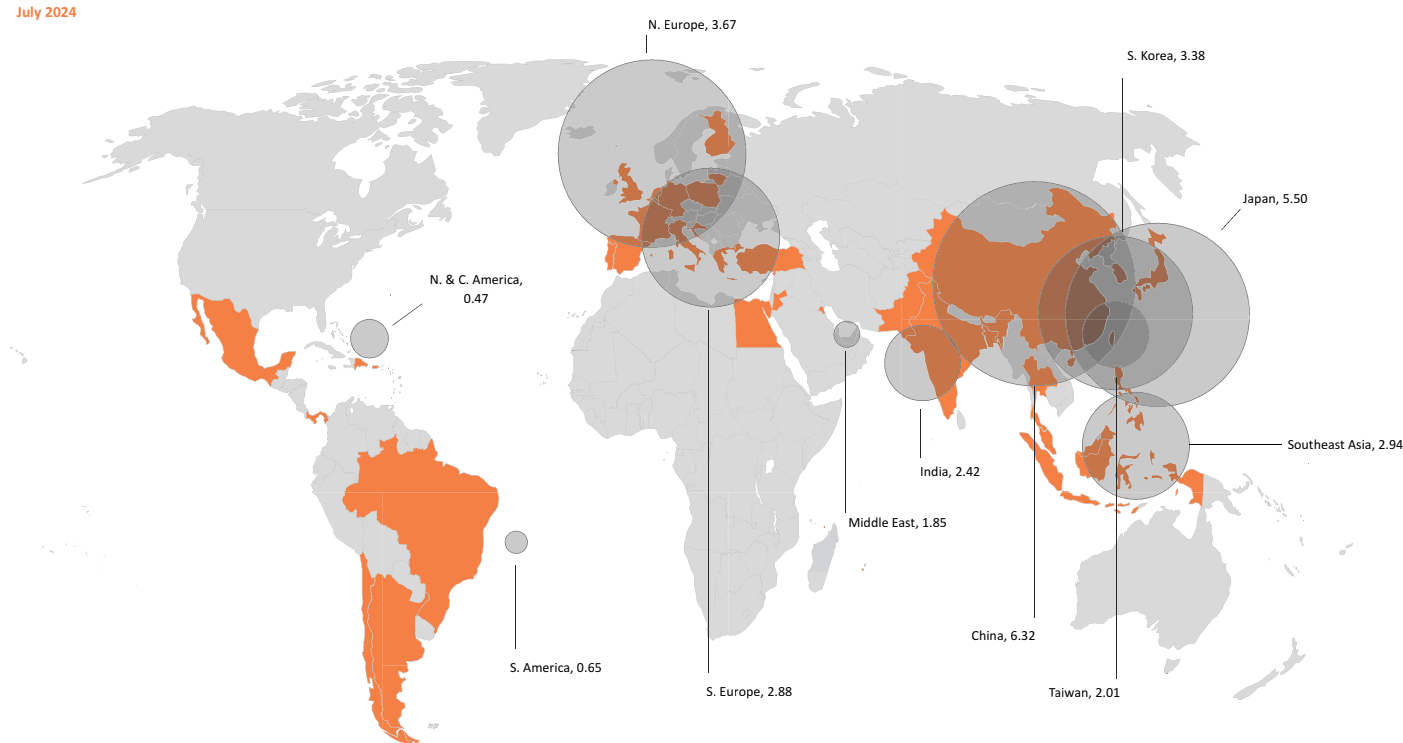
Brunei LNG recorded a production increase of 0.07mmt to 0.49mmt in July, up 17 percent from 0.42mmt in June. The plant's annualised capacity utilisation rate thus stood at 82 percent. The country's exports were spearheaded by shipments to Japan of 0.42mmt in July. This represented a month-on-month increase of 0.14mmt (50 percent) to 0.42mmt. We were also tracking a 0.07mmt cargo broadly headed to the Far East at the time of writing. In contrast,

both China and Vietnam, which had each imported 0.07mmt from Brunei in the preceding month, did not receive such flows in July.

**Russia, Peru & Mozambique:** Our data for Sakhalin-2 LNG showed an export decrease of 0.18mmt (-38 percent) to 0.29mmt in July from 0.47mmt in June due to maintenance and overhaul of process equipment. The plant's annualised capacity utilisation rate thus stood at only 30 percent. Japan led imports from the plant with 0.17mmt in July, followed by China with 0.12mmt. No LNG was exported to South Korea.

Pampa Melchorita LNG maintained July exports at 0.30mmt with shipments mainly directed to Chile and Europe. The plant's annualised utilisation rate thus stood at 81 percent. Additionally, Mozambique's Coral Sul FLNG recorded a slight production increase of 0.01mmt (3 percent) to 0.31mmt in July from 0.30mmt in June. The plant's annualised capacity utilisation rate thus stood at 109 percent. LNG exports from Mozambique were led by shipments to China, amounting to 0.16mmt. This was unchanged month-on-month. We were also tracking 0.15mmt broadly headed for Pacific.

Global LNG Imports (MMt)



Source: LNG Journal

Atlantic Basin

In contrast to export growth in the Pacific, the Atlantic Basin's overall shipped LNG had decreased in July, with exports down by 0.52mmt (-4 percent) to 12.52mmt. This translated into annualised export capacity utilisation of 71 percent for the Basin.



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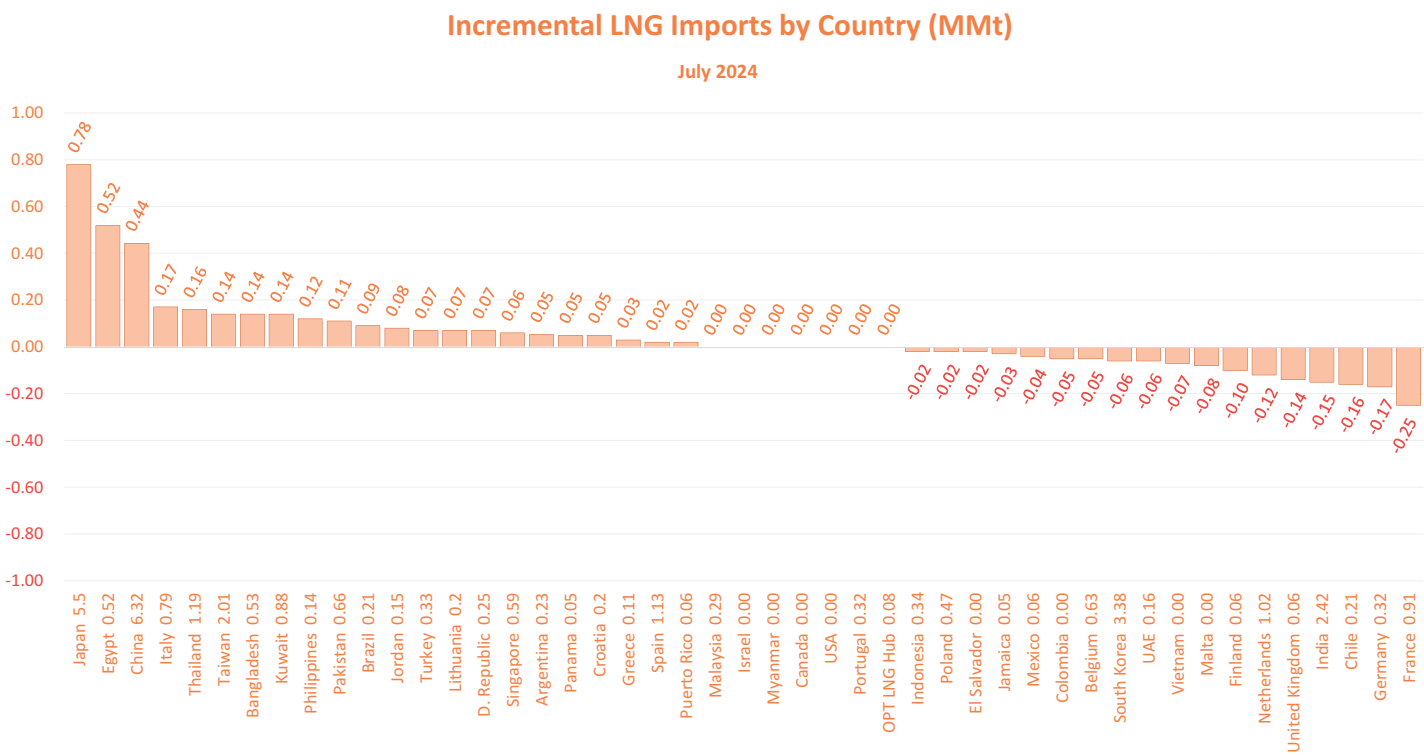
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Source: LNG Journal

**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 4.71mmt in July and thus ended the month with a trade reduction of 0.38mmt (-7 percent) from 5.09mmt in June.

Russia's Atlantic Basin capacity concluded the month with a notable decrease in shipments of 0.13mmt (-7 percent) to 1.72mmt compared to June's figure of 1.85mmt as Yamal LNG cut exports by 0.14mmt (-8 percent) to 1.65mmt from the previous month's 1.79mmt. Month-on-month growth thus only stemmed from Portovaya LNG, which increased flows by 0.01mmt (17 percent) to 0.07mmt.

Regarding notable Russia's Atlantic exports, Spain led the way, receiving 0.45mmt, though this represented a 25 percent reduction of 0.15mmt month-on-month. Belgium and France also saw decreases, with the former cutting imports by 0.05mmt (-11 percent) to 0.40mmt and the latter by 0.20mmt (-45 percent) to 0.24mmt. The Netherlands similarly reduced its Russian intake by 0.06mmt (-46 percent) to 0.07mmt. In contrast, China boosted its imports by 0.17mmt (74 percent) to 0.40mmt via shipments along the Northern Sea Route.

Our data for Norway's Snøhvit LNG showed a production increase of 0.02mmt to 0.37mmt in July, up 6 percent from June's output of 0.35mmt. The plant's annualised capacity utilisation rate thus stood at 106 percent.

Regarding LNG exports from Norway, the Netherlands led with 0.12mmt,

maintaining the same level as the previous month. France increased its imports by 0.04mmt to 0.1mmt, reflecting a 67 percent rise month-on-month. Concurrently, Finland and Greece kept their import levels steady at 0.06mmt and 0.04mmt respectively. Lithuania, however, reduced its imports by 0.06mmt to 0.05mmt, a 55 percent decrease from June. Spain, however, which had imported 0.06mmt in the preceding month, did not receive any LNG from Norway in July.

Algeria concluded July with a significant decrease in shipments of 0.26mmt (-30 percent) to 0.62mmt compared to June's figure of 0.88mmt. Arzew faced a substantial decline of 0.32mmt (-49 percent) with shipments falling to 0.33mmt from 0.65mmt the previous month. These reductions were only partially offset by Skikda's performance, which, our data shows, saw an increase of 0.06mmt (26 percent) to 0.29mmt from 0.23mmt in June.

Algerian exports were led by flows to France, which received 0.30mmt and thus saw a substantial increase of 0.16mmt (114 percent) month-on-month. Turkey also saw growth, increasing imports by 0.02mmt (8 percent) to 0.27mmt. In contrast, Italy cut its imports significantly by 0.13mmt (-72 percent) to 0.05mmt. Moreover, several countries that had received LNG from Algeria in June did not import any in July, including Argentina (previously 0.02mmt), Croatia (0.06mmt), the Netherlands (0.06mmt), Spain (0.12mmt), and the United Kingdom (0.05mmt).

**West Africa:** According to our data,

West African LNG flows increased by 0.06mmt to 2.07mmt in July compared to 2.01mmt in June.

Cameroon's FLNG unit and EG LNG in Equatorial Guinea both cut supply in July, with Cameroonian shipments falling by 0.09mmt (-56 percent) to 0.07mmt and EG LNG's exports dropping by 0.14mmt (-47 percent) to 0.16mmt. However, these reductions were offset by increases at Bonny Island, Congo FLNG and Angola LNG. Bonny Island saw a substantial rise of 0.15mmt (13 percent) to 1.35mmt, whilst Angola LNG increased flows by 0.07mmt (20 percent) to 0.42mmt. The Congo's (Rep.) FLNG unit was also seen again in the market with a 0.06mmt shipment.

The bulk of West African LNG exports went to Kuwait in July and amounted to 0.49mmt, a significant increase of 0.24mmt (96 percent) month-on-month. China also saw notable growth, increasing imports by 0.14mmt (93 percent) to 0.29mmt alongside a more modest increase of 0.01mmt (17 percent) to 0.07mmt in Thailand.

**Americas:** Our data also showed exports from the United States with a notable decrease of 0.47mmt (-6 percent) to 7.09mmt in July compared to June's figure of 7.56mmt. Freeport LNG and Cameron LNG cut exports significantly, with Freeport's shipments falling by 0.71mmt (-52 percent) to 0.65mmt and Cameron's dropping by 0.12mmt (-10 percent) to 1.12mmt. As such, these reductions were only partially offset by increases elsewhere. Sabine Pass LNG saw a rise of 0.09mmt (4 percent) to 2.44mmt, whilst Calcasieu Pass LNG

increased shipments by 0.11mmt (14 percent) to 0.90mmt. Moreover, Elba Island LNG experienced substantial growth of 0.08mmt (57 percent) to 0.22mmt, and Cove Point LNG increased by 0.05mmt (13 percent) to 0.44mmt. Finally, Corpus Christi LNG saw a slight uptick of 0.03mmt (2 percent) to 1.33mmt.

While the amount of US LNG in July ostensibly headed for Europe stood at 1.28mmt at the time of writing, the Pacific Basin led after a remarkable month-on-month increase of 1.27mmt (295 percent) to 1.70mmt. China, Jordan, France, Portugal, Finland, and Greece all saw increases in imports, with Jordan's 243 percent rise and Finland's 300 percent increase being particularly notable.

Concurrently, Atlantic LNG in Trinidad & Tobago saw a significant production increase of 0.27mmt (69 percent) to 0.66mmt in July, up from June's output of 0.39mmt. The plant's annualised capacity utilisation rate thus stood at 52 percent.

Croatia's Hrvatska LNG led as destinations for Atlantic LNG cargoes at the time of writing with 0.16mmt imported, unchanged from June. Concurrently, India and Mexico each increased imports by 33 percent to 0.08mmt, whilst Puerto Rico saw a 50 percent rise to 0.06mmt. However, the OPT LNG Hub, Chile and Malta ceased imports from Trinidad in July. Portugal and Argentina maintained their import levels at 0.09mmt overall whilst 0.19mmt still had to confirm their destinations in Europe and the Pacific region.

## Middle East

Middle Eastern LNG exports in July amounted to 7.99mmt and thus ended the month with a trade increase of 0.54mmt (7 percent) from 7.45mmt in June.

This growth was underpinned by Qatar's Ras Laffan LNG complex, which showed a production increase of 0.63mmt (11 percent) to 6.63mmt in July, up from 6.00mmt in June. The plant's annualised capacity utilisation rate thus stood at 103 percent. Of notable Qatari LNG flows, our data highlights China as destination. The country received 1.42mmt of Qatari LNG in July and thus was Ras Laffan's leading offtaker. India, South Korea, Taiwan, Pakistan, Kuwait, Japan, Thailand, Poland, and UAE also increased their imports from Qatar, with Taiwan showing a notable 47 percent rise to 0.66mmt and Thailand an even more prominent increase of 75 percent to 0.28mmt.



Meanwhile, Oman LNG saw a production decrease of 0.07mmt (-7 percent) to 0.91mmt in July from 0.98mmt in June. The plant's annualised capacity utilisation rate nevertheless still stood at 105 percent. Oman's July LNG exports to a large extent went to Japan, which received 0.26mmt. This was up 0.07mmt (37 percent) month-on-month. In contrast, Abu Dhabi's Das Island LNG cut exports slightly by 0.02mmt (-4 percent) to 0.45mmt in July, down from 0.47mmt in June. The plant's annualised capacity utilisation rate remained high at 98 percent. LNG exports from the UAE were led by India, which received 0.31mmt in July, a 29 percent increase from June.

Our data did not show LNG exports by either Egypt's Idku LNG or Damietta SEGAS LNG for July.

Imports & Domestic Trade

Global LNG demand in July amounted to 32.84mmt, our data showed at the end of the month, up 1.80mmt (6 percent) from

the 31.04mmt we recorded in June. Month-on-month growth was driven by the Pacific Basin, which saw growth of 1.32mmt (6 percent) to 22.99mmt in July, up from 21.66mmt in June. Middle Eastern offtakes were also up by 0.79mmt (50 percent) to 2.37mmt from 1.58mmt in June. However, Atlantic Basin demand was down by 0.32mmt (-4 percent) to 7.48mmt from 7.80mmt in June, mainly due to negative European demand growth.

Pacific Basin

Demand from leading Pacific importers amounted to 19.63mmt in July, up by 1.15mmt (6 percent) from 18.48mmt in June. Regional growth was underpinned by increases in Japan, China and Taiwan, which increased their combined offtakes by 1.36mmt (11 percent) to 13.83mmt. This significant month-on-month increase was tempered, however, by some negative demand growth totalling 0.21mmt (-3 percent) to 5.80mmt in India and South Korea.

Concurrently, the roster of smaller Pacific buyers – comprising Thailand,

import levels, while Poland saw a slight

Net LNG demand growth in Europe was limited to a few countries, with Italy, Lithuania and Turkey showing modest increases....

Bangladesh, the Philippines, Singapore, Malaysia, Indonesia, Mexico and Chile – collectively saw imports increase by 0.17mmt (5 percent) to 3.35mmt in July. This was primarily due to demand increases in Thailand, Bangladesh and the Philippines where offtakes were up by 0.16mmt (16 percent) to 1.19mmt, 0.14mmt (36 percent) to 0.53mmt and by 0.12mmt (600 percent) to 0.14mmt, respectively. Concurrently, Singapore saw LNG demand increase by 0.06mmt (11 percent) to 0.59mmt alongside steady demand of 0.29mmt in Malaysia. Nevertheless, the resulting demand increase was partially offset by significant reductions in Indonesia, Mexico and Chile amounting to 0.22mmt as well as the market absences of both El Salvador and Vietnam, which had imported a total of 0.09mmt in June.

decrease by 0.02mmt (-4 percent). Malta was not seen in the market following imports of 0.07mmt in June.

Concurrently, in the Americas, the Dominican Republic increased imports by 0.07mmt (39 percent) to 0.25mmt. Argentina also saw relatively robust growth of 0.05mmt (31 percent) to 0.23mmt, while Brazil's imports rose by 0.09mmt (75 percent) to 0.21mmt. Conversely, Panama and Puerto Rico experienced small increases of 0.05mmt and 0.02mmt respectively alongside a Jamaican import decrease by 0.03mmt (-38 percent) to 0.05mmt. The most significant change was in Colombia, where imports ceased entirely from 0.05mmt in June.

Middle East

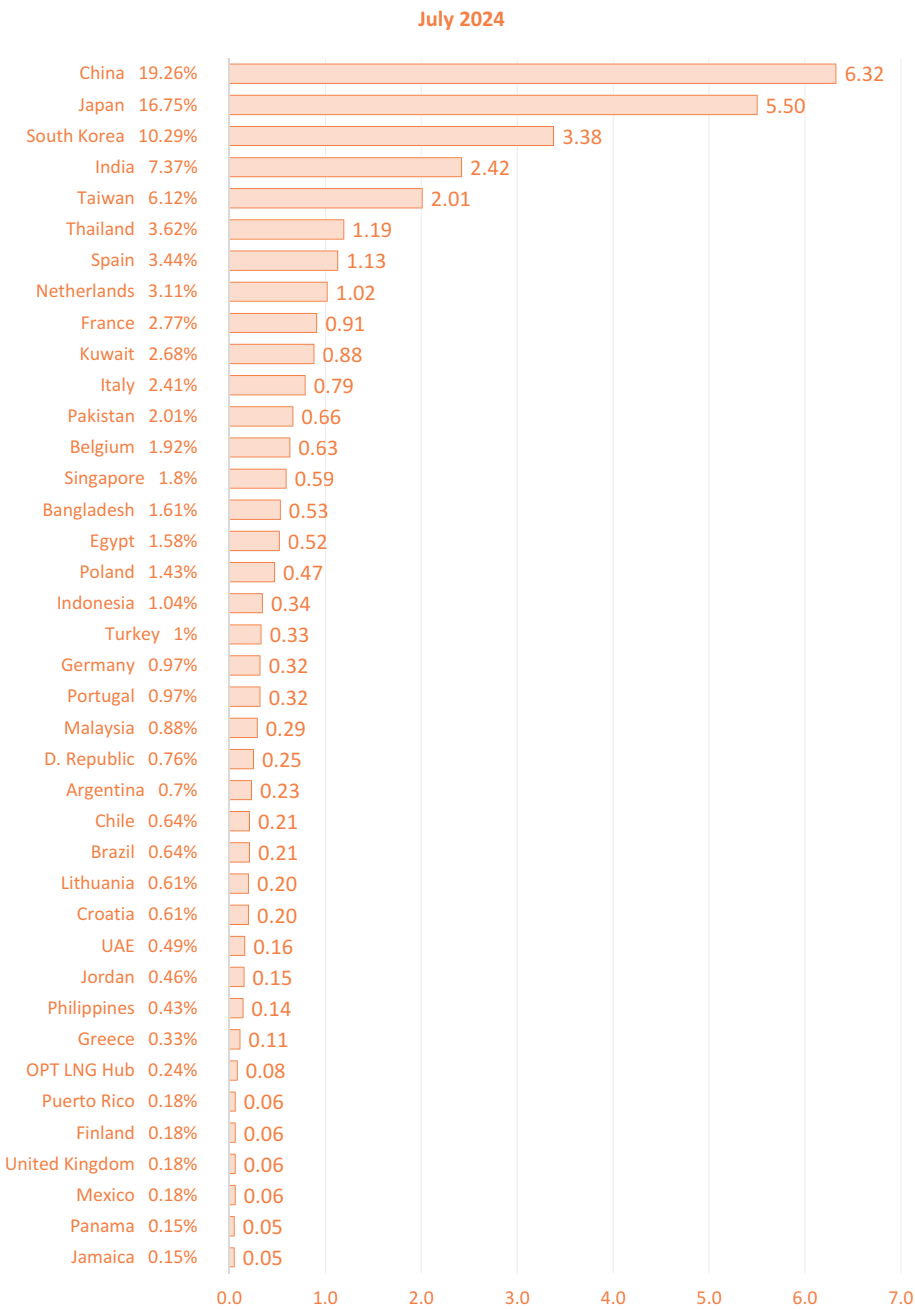
Monthly Middle Eastern LNG demand saw significant growth in July. Regional offtakes increased by 0.79mmt (50 percent) to 2.37mmt from 1.58mmt in June. The Middle East's annualised capacity utilisation stood at 45 percent in July. Importantly, Kuwait's imports rose by 0.14mmt (19 percent) to 0.88mmt, while Pakistan's imports grew by 0.11mmt (20 percent) to reach 0.66mmt. Egypt, which had no imports in June, received 0.52mmt in July via its reinstated Ain Sokhna FSRU terminal. Jordan's Aqaba terminal also showed a notable increase, importing 0.15mmt, up by 0.08mmt (114 percent) from June. The resulting net growth was thus only tempered by the UAE's import decrease of 0.06mmt (-27 percent) to 0.16mmt.

Atlantic Basin

In contrast to their Pacific counterparts, LNG imports in the Atlantic Basin decreased by 0.32mmt (-4 percent) to 7.48mmt in July compared to 7.80mmt in June, with annualised utilisation of total installed capacity at 27 percent.

Net LNG demand growth in Europe was limited to a few countries, with Italy, Lithuania, and Turkey showing relatively modest increases totalling 0.31mmt. However, overall European demand was down significantly. This was driven by steep decreases in France (-0.25mmt), Germany (-0.17mmt), and the United Kingdom (-0.14mmt), alongside reductions in the Netherlands (-0.12mmt), Finland (-0.10mmt), and Belgium (-0.05mmt). Other European countries like Portugal maintained stable

Market Share & LNG Imports by Country (MMt)



Source: LNG Journal





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# Raising the focus on LNGC cyber security

Regulations impacting the cyber security of FSRUs are many and complex, but it could also be time for a heightened focus on cyber risk associated with another link in gas value chains – LNGCs, says DNV in an industry note.

As LNG plays an increasing role in global gas trading to secure energy supply, there is growing awareness of the need to understand and protect the value chains of which it is a part.

LNG value chain has many critical maritime stakeholders, including FSRUs, LNGCs, related onshore infrastructure at ports and terminals, and suppliers of IT and operational technology (OT).

Ultimately, cyber security that protects the uninterrupted supply of gas to transmission and distribution networks is an energy security issue, the class society said.

“Gas transported ashore from FSRUs has been supporting the energy transition in Europe in recent years and DNV services have been supporting cyber-security initiatives for these regas units as critical infrastructure,” Martin Cartwright, DNV’s Global Business Director, Gas Carriers & FSRUs, explained.

“However, our experience leads us to question whether maritime is giving as much focus as it should to cyber risks that may come through LNG carriers uploading LNG to FSRUs. Where this connectivity includes IT and OT, what cyber-risk interface does it create, and how can we stop malicious hackers exploiting that?” he asked.

## Regulations variance

Newbuilding and existing FSRUs are impacted by regulations, not only as vessels but also as elements of critical infrastructure underpinning energy supply. Yet comparing cyber-security regulations for FSRUs (usually modified LNGC designs) and LNGCs reveals a gap.

Recently implemented new regulations affecting FSRUs have come from the International Association of Classification Societies (IACS, of which DNV is a member); the IMO; the EU Network and Information Security directives (NIS1, NIS2); the Oil Companies International Marine Forum (OCIMF) programme SIRE 2.0; the US Securities and Exchange Commission (SEC); DNV Cyber secure class notation (July, 2024); and country-specific laws and requirements.

However, whilst the IMO and IACS requirements apply equally to both FSRUs and LNGCs, the NIS2 Directive applies to FSRUs, as critical gas production and

storage systems, but not to LNGCs.

“There’s a marked contrast here between the regulatory position impacting FSRUs and LNG carriers,” Cartwright stressed.

The chain from liquefaction through transportation on LNGCs, reception at FSRUs, regasification and onward transport involves complex IT, OT and communications networks that are themselves interconnected.

Hence, a cyber attack on one part could potentially jeopardise seafarers, individual vessels and larger fleets, terminals, ports and the containment of the deep cooled LNG itself.

## Do LNGCs need higher cyber-security standards?

DNV’s report ‘Maritime Cyber Priority 2023’ revealed that the vast majority of maritime professionals think it is likely that cyber attacks will disrupt ship and/or fleet operations in 2024 or 2025.

“Whilst these findings from our Cyber Priority 2023 study are for all types of vessels, the key takeaway message is relevant to both FSRUs and LNG carriers,” added Svante Einarsson, DNV’s Head of Advisory Cyber Security Maritime, EMEA & APAC.

High-profile cyber incidents involving LNGCs, especially those affecting gas supply, would also increase pressure for new or further regulations to prevent re-occurrence.

International regulations through the IMO can take up to a decade to be agreed on and enforced. However, if a major flag state decides to regulate, other jurisdictions may follow suit quickly.

“For example, when the US Coast Guard (USCG) acts, other flag states may follow with similar cyber-security requirements,” Einarsson explained.

## Tougher regulation looms

US President Biden issued an Executive Order in February, 2024 proposing to expand USCG’s powers to require vessels and waterfront facilities to mitigate cyber conditions that may endanger the safety of a vessel, facility or harbour.

Einarsson said: “The IMO’s Maritime Safety Committee (MSC) accepted the EU’s proposals for enhanced ship and operation cyber security in May, 2024, with the IMO Facilitation Committee set to follow in 2025.

## Recent regulations and protocols impacting the cyber security of FSRUs

| Year introduced             | Regulations, etc.                                                                                                                                        |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2021                        | IMO Resolution MSC.428(98)                                                                                                                               |
| 2023<br>(start of 4 phases) | OCIMF SIRE 2.0 inspection programme                                                                                                                      |
| 2023                        | US SEC rules for private foreign companies                                                                                                               |
| 2024                        | 1: IACS Unified Requirements E26 and E7<br>2: DNV class notation Cyber secure becomes mandatory for most vessel types contracted on or after 1 July 2024 |
| 2024                        | EU NIS Directive from October 2024 (NIS1 already applies)                                                                                                |
| Various dates               | Country-specific laws and requirements                                                                                                                   |

Source: DNV

“So there is momentum in the industry towards greater regulation of the cyber security of newbuilding and existing ships in general, and of operations,” he warned.

## Balancing cyber requirements and practicality in modern vessel design

Consideration of the gap between what is required regarding cyber security for FSRUs and LNGCs also includes how to ensure that both newbuildings and existing vessels can be compliant now and in the future.

“Another question to reflect on is whether the highest cyber-security protection available is practical on board a ship in operation,” Cartwright pointed out.

“In principle, if there’s no business purpose for a particular connectivity for which a customer has a specific digitalisation capability, it’s best to disable it as it represents an additional surface of attack.

“However, this principle can be complicated by newer vessel designs featuring more IP-based connectivity as standard without an opt-out. Designs are becoming more digitalised, not by option but by development,” Einarsson explained.

DNV assists the LNG industry by combining deep knowledge and expertise, not only of maritime cyber security but also of vessel operations, equipment, control systems and connectivity.

Its services and solutions for managing cyber risk in maritime IT and OT include - risk assessment and testing; preparation for compliance; enhancing cyber security; validation of systems and procedures; training; third-party verification of cyber-security requirements throughout a

vessel’s life cycle; and certification against international standards.

“We also explain the complexities and what mitigation solutions we can provide given today’s regulatory environment,” says Guillaume Leleu, DNV’s Senior Maritime Cyber Security Consultant. “Part of today’s complexity comes from connecting existing ships that are not designed to meet higher cyber-security requirements to critical infrastructure that must meet such requirements.

“This is why complex projects need expertise that understands the specifics of each system, its cyber vulnerabilities and what it’s capable of.

“We’ve observed huge demand for our cyber-risk management services and solutions from shipowners and operators. Some of the most frequent issues of interest to them are assessing compliance to requirements, shaping cyber-security incident management process, supporting cyber-security management system development and training the teams on cyber security,” he said.

“Due to DNV’s expertise in cyber technology, comprehensive knowledge of marine assets and alignment with stakeholders’ business goals, regulators frequently ask our experts to review and comment on proposed new rules on maritime cyber security,” Einarsson added.

“This combination means we can advise regulators on what’s practical to do for a newbuilding or existing vessel to comply on cyber security, and on the best way of achieving it within constraints that customers face,” he concluded. ■





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# LR awards Daphne Technology with AiP for methane slip solution

*Daphne Technology's patented SlipPure system has been awarded Approval in Principle (AiP) from Lloyd's Register (LR) for its plasma-catalytic technology.*

LR witnessed the results and confirmed its performance. This recognition marked a significant milestone in the fight against methane slip in the maritime and land-based oil and gas industries, the company claimed.

The SlipPure system, which previously received AiP for its plasma-only configuration, now runs its full plasma-catalytic process.

This technology improves efficiency by lowering plasma power consumption, enabling very high methane slip reductions at exhaust temperatures well below those required for catalyst-only solutions, making it both the most effective and efficient methane slip reduction system available, the company said.

The plasma-catalysis system has also gained an AiP from DNV.

Reducing methane emissions is crucial as it is responsible for at least a quarter of the current global warming. As it has a much shorter atmospheric lifetime compared to CO<sub>2</sub>, cutting methane emissions now can lead to faster

climate benefits.

Daphne Technology believed that it was the only company actively developing a Plasma-Catalysis system for methane slip reduction.

This system integrates its patented wavelet pulse power (WPP) supply technology to generate plasma and utilises the proprietary catalyst.

SlipPure has undergone several rigorous tests utilising exhaust gas produced from a land-based test engine (746 kW lean burn spark ignited engine type RR MTU 8V4000M55RN) installed at the Maritime Centre of the University of Applied Science in Flensburg, Germany.

In January, 2023, safe operation of the WPP power supply in the plasma-only system was demonstrated over nearly 75 hours of operation.

## Evaluation

Earlier this year, the Plasma-Catalytic process was evaluated over nearly 100 hours of operation, and LR witnessed 4.0 g/kWh removal of methane slip (62%

methane slip reduction at 75% load) from exhaust gas with temperatures as low as 380 deg C.

"We are again very honoured to be working closely with Lloyd's Register and delighted to receive this AiP," said Dr Mario Michan, Daphne Technology's CEO and Founder. "This approval in principle validates our innovative approach, and the witnessed results are a testament to the efficacy and reliability of our SlipPure system.

"The performance results demonstrate our technology's readiness for market deployment and its impact on reducing methane emissions," he said.

Panos Mitrou, LR's Global Gas Segment Director, added: "LR has been working with Daphne Technology for several years and following recent testing, it's clear that its plasma-catalytic technology is moving the bar in helping companies to meaningfully mitigate methane slip in the maritime and land-based oil and gas industries."

Key Benefits of the SlipPure plasma-catalysis system include:

- Reduced Power Consumption - More energy-efficient compared to plasma-only systems.
- Feasibility - Operates effectively at the lower exhaust temperatures typical of marine engines.
- Innovative Technology - Combines the strengths of plasma and catalysis for superior methane abatement.

In addition, combining SlipPure with Daphne Technology's patented PureMetrics enhances the effectiveness of methane slip reduction by providing accurate quantification and reporting of GHG emissions.

PureMetrics is essential for monitoring the real-time impact of SlipPure, offering auditable reports and operational insights.

This integration will help ensure compliance with environmental regulations and helps companies achieve their sustainability goals by providing a clear picture of their emissions.

The next version of SlipPure is currently being designed for deployment in November, 2024 with a US oil major.



Signing ceremony at the LR Global LNG Forum 2024, from left to right: Constantinos Chaelis - LR's Gas Markets & Technology Lead; Andy McKeran, LR's CCO; Dr Mario Michan, Daphne Technology and Panos Mitrou, LR's Global Gas Segment Director.

## OrbitMI navigates LNG operations complexities

Transportation of LNG entails complex decision-making processes that must be managed effectively to ensure operational efficiency and environmental compliance.

LNG operators can now take a lead in sustainable shipping by leveraging advanced data-driven technologies to enhance performance in this fast-expanding sector, US-based OrbitMI claimed.

The LNG business is at the forefront of the green shift in shipping as LNG is seen as an important transition fuel, given significantly lower emissions than conventional fuels such as diesel and HFO. This is driving a wave of newbuilding activity.

However, these vessels also present unique operational challenges as LNG requires specialised handling throughout the voyage, with continuous monitoring of cargo temperature and pressure to manage boil-off gas (BOG) dictated by strict protocols for safety and regulatory compliance.



The fact that LNGCs use some of their

*“Optimising LNG operations for environmental performance requires an approach considering the entire voyage lifecycle...”*

cargo as fuel creates another special dynamic that impacts commercial planning, with fuel usage affected by factors, such as current prices and voyage duration.

### Complex route planning

In addition, LNGC route planning involves complex algorithms to account

for fuel efficiency, time constraints and the impact of weather on BOG generation, while proactive maintenance is dependent on predictive analytics.

The operational complexity of LNG shipping has a significant impact on compliance with environmental regulations such as CII and EEXI, going beyond charter party obligations.

OrbitMI CEO, Ali Riaz, said: “By embracing this complexity and leveraging advanced technologies and analytics, LNG operators can transform environmental challenges into opportunities for innovation and leadership in sustainable shipping practices.”

The New York-based maritime

software-as-a-service company is offering vessel performance management solutions that can be easily integrated within the complex LNGC data environments, with multiple sensors continuously collecting data on cargo condition and engine performance.

The starting point for this integration is its Orbit Reporter application, a flexible cloud-based solution for noon and event reporting that captures essential data from multiple systems, such as gas operating conditions, LNG inventory, water usage for steam plants, send-out reports, and emissions calculations.

With an easy-to-use interface and available integrations with high-frequency data sensors, Orbit Reporter is claimed to minimise the risk of inaccurate data inputting with manual reporting.

### Tailored solutions

The customisable application, with minimal installation requirements, can be tailored specifically for both LNGCs and FSRUs. OrbitMI thus caters also for the unique operational and data management needs of often overlooked

FSRUs - such as cohesive reporting structures - that serve as floating import terminals and are a smaller but essential part of the LNG supply chain.

Orbit Reporter gathers data, which is fed into the Orbit platform to unify existing systems and data feeds in a single user interface to provide a comprehensive solution for the LNG sector to meet critical business requirements for optimisation and compliance.

“Optimising LNG operations for environmental performance requires an approach considering the entire voyage lifecycle, including fuel usage decisions, management of methane slip and compliance with regulations,” Riaz added.

OrbitMI’s solutions for the LNG and FSRU markets cover a range of operational usage cases, while its partnership with class society Bureau Veritas (BV) ensures these solutions remain compliant with new and evolving regulations, such as EU ETS and FuelEU Maritime amid a constantly shifting regulatory landscape. ■

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# LNG takes lead as industry adapts to energy transition

*As major players in the shipping industry grapple with the realities of the energy transition, LNG is solidifying its position as the most viable option in the medium term, with projections for fuels like methanol and ammonia pushed further into the future. Our Fuelling editor Malcolm Ramsay has more.*

Despite initial enthusiasm for zero-carbon fuels, major players in the sector are increasingly hedging their bets as early promise proves harder to realise than expected. French multinational group TotalEnergies is one of a growing number that sees new fuels taking a long time to become established, as global markets create an ever more complex landscape for shipping lines.

“Looking ahead to new fuels such as methanol and ammonia, without doubt, there is increasing market interest,” Denis Bonhomme, Global Sales and Business Development Director, TotalEnergies Marine Fuels tells LNG Journal, but notes that there is a “big challenge” with supply and cost issues.

## Tangible infrastructure

While methanol and ammonia may command headlines, the reality is that LNG’s wider availability and lower cost currently places it ahead of rivals. Through subsidiary unit TotalEnergies Marine Fuels the group recently announced investment in a new LNG hub in the Middle East, a move that it sees as a crucial strategic development.

“The area is frequented by a multitude of tankers, bulkers, and even some cruise ships navigating the Red Sea around the UAE. Unlike Singapore and Rotterdam, which serve as endpoints along major trading routes, this hub offers a

distinctive dynamic but we foresee sound demand as well,” Bonhomme explains.

The new hub, to be located in the port of Sohar in Oman, will be the first LNG bunkering hub in the Middle East, South of Fujairah and once complete will feature an LNG liquefaction plant with nameplate capacity of 1Mt/year. Known as the Marsa LNG plant it will be 100% electrically driven and supplied with solar power, making it one of the lowest emissions intensity LNG plants ever built worldwide, with a GHG intensity below 3 kg CO<sub>2</sub>e/boe.

Under the terms of a Sale and Purchase Agreement signed with Oman LNG, the firm will supply 0.8 Mtpa of LNG for ten years from 2025. TotalEnergies has also partnered with OQ Alternative Energy to jointly develop a portfolio of up to 800 MW in solar power, including the 300 MWp solar project that will supply Marsa LNG.

“Looking at strategic development, our goal is to build on our low carbon fuel solutions in main hubs, optimizing our logistics capacity in terms of storage and bunker vessels,” Bonhomme adds.

## Leading Contender

The financial closure on this project, and solid roadmap for development contrasts with much fuzzier industry plans for alternative fuels. Shipping line Maersk recently announced a major u-turn as it faces the reality that methanol supplies

will not be available in sufficient volume or at the right price to meet its strategic aims. Previously a staunch supporter of methanol, and critic of LNG, Maersk has shifted its stance due to the slower-than-anticipated development of green methanol facilities and the limited availability of methanol at major ports. Consequently, the Danish shipping company has now turned to embrace LNG as a fuel source.

“Two years ago, potential green methanol suppliers were telling us about 2024 deliveries, but now no one can deliver,” Xie Wenxuan, China decarbonisation business development manager at Maersk, said.

Reports indicate that Maersk is in advanced discussions with suppliers to develop a fleet of large LNG-powered container ships. Five LNG dual-fuel container ships ordered by SFL Corporation and a further five from Seaspan are all now expected to be chartered by Maersk. The company is said to be planning a fleet of at least 23 dual-fuel LNG vessels in total, although terms of any deals remain undisclosed.

TotalEnergies also sees challenges ahead for methanol but expects growth in demand for the fuel nonetheless, with Bonhomme noting “without doubt, there is increasing market interest and projected growing demand for low-carbon methanol in the mid-term. We think methanol will be arriving on the market sooner but pricing and availability issues need to be addressed.”

With a fleet of more than 250 methanol dual-fuel vessels, either on order or in the water, the addressable market is significant but lack of availability of methanol means that the majority of these vessels will be powered by traditional fuel oils in day-to-day use for some time to come.

“We see it ramping up before the end of the decade and foresee up to 10 million tonnes of green methanol [demand] by the end of the decade,” Bonhomme adds. “Today, we produce 700 kt of



**Denis Bonhomme, Global Sales and Business Development Director, TotalEnergies Marine Fuels**

grey methanol in Europe. H<sub>2</sub> can also be turned into e-methanol. We can also produce bio-methanol. But there is a big challenge with methanol today though, in terms of supply and cost.”

## Long-term transition

Looking further ahead, more progressive fuels such as ammonia and hydrogen are also expected to join the mix but these present even more complex challenges as in many cases they cannot be used as drop-in fuels, but will instead require completely new bunkering and propulsion systems.

“We anticipate that ammonia development will likely only progress significantly from 2030,” Bonhome predicts. “There are two big challenges: first is safety and second is production. Currently, there is no production of green ammonia whatsoever [and] the costs associated with green ammonia production are considerable.”

Despite these challenges, TotalEnergies sees a long-term future for ammonia in the mix and is already participating in some working groups, notably the Itochu-led working group in Singapore and a separate Maritime and Port Authority of Singapore working group.

A key step for this will be green hydrogen production, which is a prerequisite for clean ammonia, and the firm is actively pursuing projects to this end, however, as of now, there is no such production in place. ■



**Aerial view of LNG bunkering operation**





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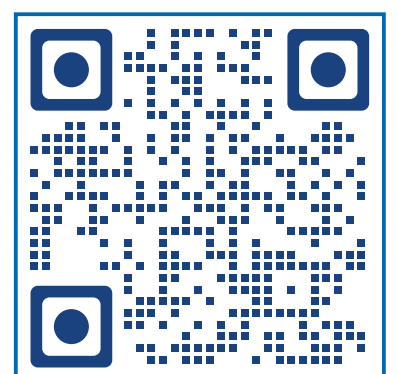
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# For the Record

**ASIA** - The ongoing Asian heatwave has boosted demand for LNG imports into the region.

For example, China has reported its hottest ever July since records began.

Imports reached 68 mill tonnes in the second quarter of 2024 - a significant increase from previous years.

Asia is now the preferred destination for US LNG.

Illustrating the demand, Japanese utilities were seeking additional volumes for August and September.

Masanori Odaka, senior analyst at Rystad Energy, talking with newswires, said that the arbitrage for US free-on-board (FOB) LNG cargoes to Asia reopened on 23rd July after briefly shutting on 16th July.

Despite Asia's strong demand, spot LNG prices for September delivery actually fell by 1.4% week-on-week to around \$12 per MMBtu as of 23rd July, while October 2024 financial derivatives traded at around \$12.1 per MMBtu, down 3.6% from the previous week.

Weather forecasts indicated a high probability of above average temperatures across Japan and South Korea in the coming weeks, which would suggest an ongoing high demand for fuel for air conditioning, etc.

Japan's major power utilities have reported 2.35 mill tonnes of LNG in storage as of 21st July, a 6.8% increase week-on-week and significantly above the five-year average.

On the supply side, Russia's Sakhalin 2 LNG plant has resumed production on both trains following maintenance, while Yamal LNG delivered its first cargo this year to Asia via the Northern Sea Route on 14th July.

As Asia's LNG demand continues to expand, the global energy market is likely to see significant changes, with potential shifts in trade flows and pricing dynamics in the coming months, Reuters reported.

**BAKER HUGHES**, the US liquefied natural gas equipment-maker and energy services company, reported a surge in net profits and revenues amid growth in orders including for gas field services in Algeria and LNG in Australia.

Baker Hughes, which has main offices

in Houston and London, has two divisions, Industrial & Energy Technology (IET), including LNG, and the Oilfield Services & Equipment (OFSE) unit.

"Our strong second-quarter results further demonstrate that we are on the right path in executing our strategy," said Lorenzo Simonelli, Baker Hughes Chairman and Chief Executive.

"We continue to strengthen our operating performance, which is driving meaningful margin expansion across both segments. Following our first-half outperformance, we are raising the midpoint of our full-year guidance by 5 percent and are confident in our ability to drive margins structurally higher over the coming years," said Simonelli.

"Order momentum continues, highlighted by \$3.5 billion of IET orders during the quarter that included a large Sonatrach award for gas-boosting in Algeria's Hassi R'Mel gas field," stated the CEO.

"This marks the highest quarterly non-LNG equipment booking in the company's history and again underscores the breadth and versatility of our IET portfolio," Simonelli said.

"New energy continues to gain momentum as we booked \$445M of orders, also a record for the company," he added.

The CEO noted that across both segments, the company delivered "outstanding second-quarter results", leading to a 25 percent year-over-year increase in total company adjusted gross earnings and 46 percent growth in adjusted earnings per share.

"This is a testament to the enhanced operational rigor that is being exercised across our IET and OFSE segments," the CEO said.

Second-quarter net income jumped to \$579 million from \$410M, an increase of 41 percent.

The Houston, Texas-based company said that quarterly revenues edged higher by 13 percent to \$7.14 billion compared with \$6.31Bln in the prior-year quarter.

Baker Hughes maintained its high level of orders to \$7.52Bln, up from \$7.47Bln in the same three months of 2023.

During the quarter, Baker Hughes signed a 10-year services frame agreement with Woodside Energy to support LNG operations in Australia.

In Gas Technology Services (GTS) Baker Hughes also extended a service agreement with a major North American LNG customer.

The OFSE business segment continued

to strengthen its relationship with Brazilian oil and gas company Petrobras, receiving multiple significant contracts for integrated and mature assets solutions.

The state oil company of the Azerbaijan Republic in Central Asia signed a joint cooperation agreement with Baker Hughes to employ more than 150 electrical submersible pumps and the automated field production solution, in the nation's oilfields, which is expected to drive optimisation and efficiencies.

**CAPITAL PARTNERS (CPLP)**, an owner and investor in LNGCs, has been given the green light to convert the company from a Marshall Islands limited partnership to a Marshall Islands corporation.

In addition it was agreed to rename the company, Capital Clean Energy Carriers Corp.

CPLP had gained the approval of a majority of its unitholders, the Board's conflicts committee. the full Board and the company's general partner, Capital GP. Capital GP will also give up its management and consent rights with respect to CPLP.

The company said that the conversion and the name change were key milestones in its switch towards the transportation of various forms of natural gas to industrial customers, including LNG and new commodities emerging as a result of the energy transition, as initially announced in November, 2023.

To achieve the switch, CPLP had entered into the umbrella agreement with its sponsor, Capital Maritime & Trading Corp, and Capital GP, to acquire 11 newbuilding LNGCs, of which five are already operating.

The remaining six vessels are expected to be delivered between the first quarter of 2026 and the first quarter of 2027.

In June, 2024, CPLP ordered 10 high-specification gas carriers, including four handy multi-gas carriers able to carry liquid CO<sub>2</sub>.

These, along with the newbuilding LNGCs, will form the energy transition vessels, the company explained.

This \$3.9 bill investment, notable both in asset value and scope, demonstrates the company's commitment to becoming a leading provider of transportation for LNG and other clean fuels, it claimed.

CPLP also said that it had already made significant progress on the business' realignment with 12 latest generation LNGCs currently on the water, plus the

disposal of seven containerships during the first half of 2024.

Upon delivery of the remaining energy transition vessels, the new company expects to become the largest US listed LNG shipping company.

The conversion and name change are scheduled to be completed by 26th August, 2024, upon which, the common shares will trade on the Nasdaq Global Select Market under the name Capital Clean Energy Carriers Corp with the ticker symbol "CCEC".

Meanwhile, CPLP's net income for the quarter ended 30th June, 2024, was \$34.2 mill, compared to \$7.4 mill for 2Q23.

Total revenue for 2Q24 was \$97.7 mill, compared to \$88.5 mill during 2Q23. This increase was primarily down to the revenue contributed by the newbuildings acquired by the Partnership, partly offset by the sale of some of the vessels.

CEO, Jerry Kalogiratos, of the General Partner, commented: "This has been another quarter of key milestones for the Partnership. First and foremost, the renaming of the Partnership as Capital Clean Energy Carriers Corp and its conversion into a Marshall Islands corporation with high standards' corporate governance, is an important step in our strategic evolution, which we announced in November, 2023.

"In addition, the delivery during the quarter of three latest generation LNG carriers takes our LNG fleet to 12, with another six to come in 2026/2027.

"The acquisition of 10 specialist gas carriers in June further cements our pivot toward one of the world's leading platforms of gas carriage solutions with a focus on energy transition, while we continue to evaluate our divestment plans for our legacy container vessels.

"The current platform is well placed to grow over the next 30 months with the addition of 16 new vessels supported by a current contract backlog of more than \$2.8 bill," he added.

**CHART** Industries, the US equipment-maker for liquefied natural gas and other clean energy and industrial gases markets, said its technology enabled the delivery of first LNG to the New Fortress Energy production project offshore Altamira in the Gulf of Mexico.

Chart said that NFE's "Fast LNG" facilities were using the Atlanta, Georgia-based company's Integrated Pre-Cooled Single Mixed Refrigerant (IPSMR®) process technology.

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establishes itself as the fastest large-scale LNG project ever developed,” Chart said.

NFE’s proprietary “Fast LNG” design is the first of its kind, pairing the latest advancements in Chart’s modular liquefaction technology with jack up rigs and offshore infrastructure to enable a faster deployment.

With a production capacity of 1.4 million tonnes per annum in a single liquefaction Train, the facility is set to “play a pivotal role in supplying low-cost, clean LNG” to NFE’s downstream terminal customers.

“We appreciate our long-standing partnership with Chart Industries who played a pivotal role in our offshore development in Altamira,” said Wes Edens, NFE Chairman and Chief Executive after the LNG announcement on July 19.

“This represents a transformative moment for NFE and the industry as a whole, and reaffirms our position as a fully integrated leader in the global LNG market,” he added.

Jill Evanko, Chart’s CEO and President, was delighted with the successful display of the Chart processing.

“We are proud to support NFE and the industry with our modular liquefaction technology and all mission critical equipment, including brazed aluminum heat exchangers, cold boxes and air coolers,” Evanko explained.

“We congratulate NFE for this success and we look forward to further supporting the industry with our modular, adaptable, resilient and cost-effective technology and products,” the Chart CEO stated.

In Chart’s previous earnings issued in May 2024, the company reported a record backlog of more than \$4.3 billion as LNG orders continued to flow from global ventures.

Chart noted orders for 51 LNG trailers in China in the first quarter of 2024.

The company also logged a liquefaction equipment order for the Canadian Cedar LNG project being developed in the Douglas Channel in British Columbia by the Haisla First Nation and Pembina Pipeline Corp.

Chart’s backlog reached a record level of \$4.33Bln in the first quarter of 2024 compared with \$3.85Bln in the previous quarter and \$4.27Bln in the prior-year quarter.

**CHENIERE ENERGY’s** subsidiary Cheniere Marketing, has signed a long-term LNG sale and

purchase agreement (SPA) with Galp Trading, a subsidiary of Portuguese energy company, Galp Energia.

Under the SPA, Galp will purchase around 0.5 mill tonnes per annum of LNG for 20 years from Cheniere Marketing on a free-on-board basis (FOB) for at a cost indexed to the Henry Hub price, plus a fixed liquefaction fee.

Deliveries are expected to commence in the early 2030s and are subject to, among other things, a positive final investment decision (FID) on the second train (Train eight) of the Sabine Pass Liquefaction Expansion project (SPL).

The SPA also includes a limited number of early cargoes to be purchased by Galp prior to Train eight’s start up.

“We are pleased to enter into this long-term agreement with Galp, a leader across Iberia’s energy sector, which reinforces the critical role US natural gas is expected to play in Europe’s energy mix into the second half of this century,” said Jack Fusco, Cheniere’s President and CEO. “We look forward to providing our flexible, reliable and cleaner burning LNG to Galp under this new long-term agreement.

This SPA is expected to provide further support for the SPL expansion project, and demonstrates continued momentum as we progress development of the project.”

The SPL expansion project is being developed for up to 20 mill tonnes per annum of LNG capacity, inclusive of estimated debottlenecking opportunities.

In February, 2024, Cheniere Energy Partners’ subsidiaries submitted an application to the US Federal Energy Regulatory Commission (FERC) for authorisation to site, construct and operate the project, as well as an application to the US Department of Energy (DoE) requesting authorisation to export LNG to free-trade agreement (FTA) and non-FTA countries.

**CHINA** and South Korea were the top destinations for US LNG delivered in July.

In contrast, US flows to Europe dropped to their lowest level since September, 2021, according to S&P Global Commodity Insights’ analysis.

In July, rising demand in the Pacific Basin, particularly in southeast Asia, contributed to the drop in US LNG cargoes shipped to Europe, which received less than half of the US volumes delivered for the third consecutive month.

Europe, including Turkey, imported 34

cargoes from the US last month, amounting to less than a third of all US LNG cargoes delivered throughout July.

China and South Korea each received 11 US LNG cargoes last month, followed by Japan with nine, and India, the Netherlands and Argentina, with eight each, Commodity Insights data showed.

In total, US cargoes arriving in Europe, including Turkey, saw a decline from the 43 delivered in June, while Asia received 49 cargoes in July, up from 39 in June.

Shipments to India, which was one of the top destinations for US LNG cargoes in June, came as hotter than expected temperatures continued to drive demand in the region.

Overall, the 117 US LNG cargoes delivered in July was an increase from the 104 cargoes delivered in the previous month.

The increase was caused by the majority of cargoes heading for Asia/Pacific opting for the longer route around the Cape of Good Hope amid constraints at the Panama and Suez canals.

Loadings in July declined to 98 cargoes, down from 110 in June, which was due in part to the Freeport LNG export terminal shutting down on 7th July ahead of Hurricane ‘Beryl’s’ landfall on the Texas Gulf Coast.

The storm knocked out Freeports’ power damaging part of the facility, keeping feedgas deliveries close to zero for over a week before the terminal ramped back up to close to full utilisation by the end of the month.

However, global LNG market fundamentals remained largely bearish heading into August, with healthy storage levels in Europe and muted buying interest in South Asia and China.

Last week, the average LNG price for September delivery into northeast Asia was \$12.80 per MMBtu, industry sources told newswires, the highest level since mid-December last year and up from the \$12 per MMBtu reported the week before.

Going forward, demand could be tempered by events in the Middle East, although a closure of the Strait of Hormuz was deemed unlikely.

On the supply side, Sakhalin is undergoing a maintenance period and only loaded five cargoes in July, compared to the normal 15-16, according to ICIS.

Australia’s Ichthys LNG plant resumed operations following an outage at one of its trains and was operating at around 70-80% capacity, sources told Reuters.

In Europe, geopolitical risks, high temperatures, September’s Norwegian Shelf maintenance programme and the strengthening of Asian price levels, resulted in the northwest LNG price rising by 11.5% last week to \$11,475 per MMBtu on 1st August for September cargoes delivered on an ex-ship (DES) basis, said Karim El Afany, Managing Editor of Atlantic LNG at S&P Global Commodity Insights.

Atlantic LNG LNGC rates had fallen for the fourth consecutive week to \$73,700 per day by 2nd August, while Pacific rates were assessed at \$75,250 per day, rising for the sixth week running, according to Spark Commodities.

**CROWLEY** Maritime has taken delivery of the LNG bunker barge ‘Progress’ from Fincantieri Bay Shipbuilding in Sturgeon Bay, Wisconsin, US.

The barge is claimed to be the largest US Jones Act compliant vessel of its kind.

‘Progress’ will operate at the Port of Savannah, Georgia, upon her final commissioning this month.

Energy giant Shell has signed a long-term agreement with Crowley to operate the barge.

“The ‘Progress’ LNG bunker barge sets a new standard for quality and capability to serve the energy needs of the shipping industry,” said James Fowler, Crowley Shipping’s Senior Vice President and General Manager.

“LNG offers a safe and reliable solution for ocean carriers that advances the transition to lower emissions. We congratulate the people whose dedication and hard work in designing and building this world-class vessel allowed us to reach this milestone for the US industry and our customers,” he said.

Designed by Crowley’s engineering services group, the 416 ft long barge has a capacity of 12,000 cu m (3.17 mill gallons). Her design includes the capability, developed by Shell and Crowley’s engineers, to deliver LNG to various types of LNG containment systems.

“Fincantieri Bay Shipbuilding continues to be an industry leader in building LNG bunkering barges. We take tremendous pride in seeing another FBS-built vessel leave Sturgeon Bay to its new operational home port. I am proud of the work of our entire Fincantieri Bay Shipbuilding team,” added Jan Allman, Vice President and General Manager of Fincantieri Bay Shipbuilding.



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**DEUTSCHE ENERGY TERMINAL (DET)** on 7th August, the German state-owned terminal operator achieved its 100th LNG delivery.

A 165,000 cu m cargo for the German market was delivered to Wilhelmshaven (WHV01), thus reaching this milestone.

Since the beginning of operations last year, this journey has been marked by close co-operation and strong teamwork with partners, DET said.

DET named its business partners and suppliers on the sites at WHV01 and Brunsbüttel Gasfin Development, as Reganosa Deutschland, Höegh, LTeW, Brunsbüttel Ports, KN Energies and Niedersachsen Ports, who all have contributed to this accomplishment.

Out of the 100 deliveries, 71 have arrived at Wilhelmshaven and 29 at Brunsbüttel.

As for HEH at Stade, from 7th August, Niedersachsen Ports are carrying out planned dredging on the liquefied gases jetty (AVG) at Stade-Bützfleth.

In order to undertake the work, the FSRU ‘Energos Force’ was moved off the berth and temporarily anchored in the outer Elbe area.

After completion of the dredging, the FSRU will return to her berth and will continue to be prepared for commissioning, which is planned for the second half of this year, DET said.

In 2023, Niedersachsen Ports built the AVG in Stade-Bützfleth on four hectares of water. The berth has a draught of up to 16.4 m, and the length of the quay is 1.6 km.

‘Energos Force’ is 294 m in length and has a storage capacity of 174,000 cu m with a regasification capacity of up to 750 mill cu ft per day.

**EAST MEDITERRANEAN** LNG prices hit a near two-month high on 25th July, compared with West Med prices.

A heat waves across both regions resulted in buyers bidding higher levels for LNG, tempting cargoes away from Northwest Europe and Asia, sources told S&P Platts.

Platts, part of S&P Global Commodity Insights, assessed the East and West Med LNG markers for September at \$10.429 per MMBtu and at \$10.294 per MMBtu, respectively, last Thursday.

The 13.5 cents spread between the regions was the widest seen since 16 cents per MMBtu recorded on 7th June.

Both areas were offering LNG at premiums over the Dutch TTF gas hub to pull cargoes away from Northwest Europe.

Platts assessed the West Med marker at parity to NWE on 25th July, up from the 3 cents per MMBtu discount the day before. East Med was assessed at a 13.5 cents per MMBtu premium over NWE, up from the 10.5 cents per MMBtu premium, according to data from Commodity Insights.

Mediterranean imports totalled 2.28 mill tonnes to that date, up 0.26 mill tonnes, or 13%, compared to the same period last year, Commodity Insights data showed.

The highest increase came from Spain, which saw imports rise 54% on the year, as it imported 1.65 mill tonnes in July, the highest European level.

East Mediterranean imports have risen 31% on the year between 1st and 26th with Turkey seeing imports more than double year-on-year to 0.62 mill tonnes from 0.27 mill tonnes, according to the data.

Heat waves in the West Med - affecting Spain, Portugal and the South of France - as well as some Portuguese net withdrawals, pushed buyers to bid higher for their cargoes.

Gas inventories in Spain and France were high, at 75.68% and 97.8% full, respectively, according to the latest data from Aggregated Gas Storage Inventory.

Although Portugal has also seen healthy levels, at 96.86% full, storages fell 4.47% on the week.

Sellers with the shipping flexibility in their contracts were taking cargoes to the Med, where demand was stronger as Northwest Europe remained depressed.

However, favourable arbitrage economics could also be leading to higher re-exports from the region to Asia. The need to replenish domestic demand and favourable re-export volumes could together be pressuring prices, sources said.

Although the East Med was still pricing at premiums to TTF, traders saw LNG demand in the region lagging, due to access to cheap pipeline volumes.

"The market has had variations, especially the Greek market has had poor liquidity," a trader said. "As long as LNG is pricing at a premium, gas will be the dominant supply choice."

"Greece has the Russian gas and volumes through the TurkStream pipeline," the trader added.

**EDISON**, the Italian small-scale LNG operator, has completed an LNG refuelling operation at Trieste.

The ship-to-ship bunkering operation

is the first to take place in the Adriatic Sea and the first to be carried out by Edison.

The LNG was supplied by the ‘Ravenna Knutsen’, which has been supplying gas the Ravenna LNG coastal depot (DIG) – forming part of the Group's integrated logistics chain and contributing to the de-carbonisation of road and maritime transport – since 2021.

This operation marks the start of more ship-to-ship bunkering operations at Trieste, the company said. .

“We are proud to support our clients on their de-carbonisation path and to announce the first ship-to-ship LNG refuelling in the Adriatic Sea. I would like to thank all the authorities, and in particular the Port Authority of Trieste, who made this important milestone possible,” said Fabrizio Mattana, Edison’s Executive Vice President for Gas Assets.

“After the commissioning of the coastal depot in Ravenna, which has become the reference in Italy for LNG supply in road transport, thanks to today's operation Edison is the first in the LNG supply market for the maritime segment.

“This is a sector with a high potential for reducing its emissions, and LNG is the solution available and competitive today.

“To consolidate our market presence, we are also developing a second LNG coastal depot in Southern Italy and a second LNG carrier ready for bunkering operations. So many concrete steps that confirm our commitment to sustainable mobility in Italy and the Mediterranean Sea,” he said.

‘Ravenna Knutsen’ is described as a unique small LNGC with extreme operational flexibility, available to Edison under a contract with Norwegian shipowner, Knutsen OAS Shipping.

She was built by Hyundai Heavy Industries’ Mipo shipyard in South Korea and can transport up to 30,000 cu m of LNG via three high-nickel steel tanks that are suitably insulated to withstand cryogenic temperatures.

The ship is fitted with a double set of cargo manifolds (both low and high), which gives the vessel the utmost operational versatility, making her capable of operating with storage facilities and vessels of different sizes.

**ENEL** Group reported a drop in first-half revenues of almost 18 percent amid falling prices and lower volumes sold, though net income increased.

The Italian utility company’s revenues

declined to €38.73 billion in the six months from €47.09Bln, a drop of 17.8 percent from the first-half of 2023.

Enel is involved in natural gas and thermal energy markets in Italy, Spain and in South American nations such as Argentina, Chile, Colombia, Brazil and Peru.

The group’s natural gas sales amounted to 4.1 billion cubic metres in the first half of 2024, a decrease 18 percent, or 0.9 Bcm in the same period of 2023.

The net electricity generated by the Enel Group in the first half amounted to 96.74 terawatt hours (TWh), a decline of 5.3 TWh on the same period of 2023.

“The change is mainly attributable to the market context with declining prices alongside lower energy volumes from thermal sources and a decrease in quantities of electricity sold on end-user markets,” Enel explained.

“These effects were partly offset by an increase in revenues from the sale of electricity generated by renewable sources and from the management activities of distribution networks,” stated Enel.

The utility’s ordinary gross earnings increased by 8.8 percent to €11.68Bln from €10.74Bln in the first half of 2023.

“The increase is attributable to the positive contribution of the integrated businesses, driven by the excellent performance of renewable energy, which more than offset the decrease in the margin recorded in end-user markets and thermal generation,” Enel explained.

The group’s ordinary net income surged by over 20 percent to €3.95Bln from €3.28Bln in the prior-year period.

“In the first half we achieved excellent results, driven by significant organic growth reached through the strict implementation of the pillars of our Strategic Plan,” said Enel Chief Executive Flavio Cattaneo.

“The managerial actions undertaken have already allowed us to restore sound operating cash flow generation and reduce our financial debt to around €55Bln, also taking into account the transactions currently being finalized and already announced to the market, therefore reaching one of the lowest levels of leverage in the entire sector,” Cattaneo stated.

**EQT** Corp, the largest shale-gas operator in the US Appalachian Basin and a future LNG market stakeholder, has completed the acquisition of



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tedlar® laminated stainless steel and aluminium jacketing • cladding coil, sheet, perforated  
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15055 West Drive  
77053 Houston, Texas  
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Equitrans Midstream earlier than expected after the Equitrans-operated Mountain Valley Pipeline came online in June 2024.

Pittsburgh, Pennsylvania-based EQT said that the completed merger has created America's only large-scale, vertically integrated natural gas business.

According to EQT, the combined company is projected to have an unleveraged NYMEX natural gas free cash flow breakeven price of around \$2.00 per million British thermal units.

"This is at the low end of the North American cost curve and ensures robust free cash flow generation through all parts of the commodity cycle," stated EQT.

EQT added that it had identified more than \$425 million of annual synergies associated with the combination, which upon realization could drive even further downside to EQT's long-term free cash flow breakeven price.

The integration of the midstream assets of Equitrans also improves the economics of EQT's 4,000 drilling locations, and unlocks terminal value at a

time when demand for natural gas is inflecting both domestically and abroad.

"We are excited to complete this highly strategic transaction significantly ahead of our original timeline, and welcome both Equitrans employees and shareholders to EQT," said Toby Z. Rice, President and Chief Executive of EQT.

"The early close resulted in nearly \$150M of savings relative to our original forecast and brings forward our de-leveraging and synergy capture timetables," he added.

Rice stated that the company was wasting no time unleashing its integration team, which has a successful track record of rapidly integrating three large-scale acquisitions over the past several years.

"This combination leaves EQT in a tremendously advantaged position to compete and win as we enter the global era of natural gas," Rice added.

The Mountain Valley Pipeline (MVP), whose final cost was estimated at \$7 billion, eventually came on line in June 2024.

The EQT-Equitrans transaction, with

an enterprise value \$35 billion, was first announced in March 2024 and had earlier been forecast to close in the fourth quarter of 2024.

It was crucially contingent on the US Federal Energy Regulatory Commission letting the MVP start operations and this happened earlier than most people expected.

The MVP spans the states of Virginia and West Virginia with Equitrans as the pre-merger operator.

Construction of the pipeline had been severely slowed by court challenges until a congressional spending deal was achieved in 2023 by Senator Joe Manchin, a conservative Democrat from West Virginia who supported the project and who gained the consent for the pipeline from the Biden Administration.

President Biden on June 3, 2023, signed legislation that raised the nation's debt limit and ratified and approved all permits and authorizations necessary for the completion and initial operations of the MVP.

The completed natural gas pipeline, which has been in the design and

construction stages since 2014, runs from the northwest of West Virginia to southern Virginia.

The pipeline is now a part of a critical network of more than 300,000 miles of interstate and intrastate natural gas transmission pipelines transporting US natural gas.

MVP is designed to transport natural gas from the prolific Marcellus and Utica shale regions to the growing demand markets of the mid-Atlantic and southeast regions of the US.

EQT has widespread shale-gas operations in the Marcellus and Utica formations of western Pennsylvania, Ohio and West Virginia,

EQT has also signed several LNG accords including with the Texas LNG project at the Port of Brownsville owned by the leading infrastructure developer Glenfarne Energy Transition.

MVP is a 42-inch diameter pipeline that extends from Equitrans's existing transmission and storage system in Wetzel County, West Virginia, to Transco Station 165 in Pittsylvania County, Virginia.



Courtesy of EConnect Energy AS – Courtesy of Excelerate – Courtesy of TES



**MIB ERS on IQuay F-Class System Gas Balcony provided by EConnect for TES Wilhemshaven Project FSRU**



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In conjunction with the closing of the EQT-Equitrans transaction, and as previously announced under the terms of the merger agreement, three former Equitrans directors, Vicky A. Bailey, Thomas F. Karam, and Robert F. Vagt, have joined the EQT Board effective immediately.

Guggenheim Securities, LLC acted as lead financial advisor and RBC Capital Markets, LLC acted as a financial advisor to EQT.

Kirkland & Ellis LLP served as EQT's legal counsel on the transaction.

Barclays and Citi served as financial advisors to Equitrans, and Latham & Watkins LLP served as legal counsel to Equitrans.

**EQUINOR**, the Norwegian LNG exporter and main supplier of pipeline natural gas to Europe, posted a slight rise in second-quarter net income as new fields came on stream on the Norwegian Continental Shelf amid continued high grading of the company's oil and gas portfolio.

The Stavanger, Norway-based

company reported that net income increased to US\$1.87Bln, up from \$1.83Bln in the same three months of 2023.

However, Equinor delivered lower second-quarter adjusted operating income of \$7.48Bln, down from \$7.79Bln in the prior-year quarter.

Equinor also posted lower net operating income of \$2.42Bln compared with \$2.71Bln in the same three months of 2023.

High production particularly from the Troll and Oseberg fields contributed to a 13 percent increase in gas output compared to the same period last year.

"Field developments and high production contributes to energy security for Europe. To unlock further long-term value creation we continue to optimise our portfolio," said Anders Opedal, Equinor President and Chief Executive.

"We also progressed our renewables projects and accessed three new licences for CO2 storage to build a profitable business for a future low-carbon energy system," he added.

On the NCS, Equinor said there was

also a strong operational performance and lower impacts from turnarounds, together with new production from the Bredablikk field, which contributed to a production growth of 5 percent from last year.

Internationally, the Buzzard field offshore the UK and new wells contributed to production but was offset by lower output from the US due to turnarounds offshore and planned curtailments onshore.

Equinor completed seven exploration wells offshore, including the Argerich well in Argentina, with no commercial discoveries.

Equinor and its partners additionally made an investment decision for further development of natural gas infrastructure in Norway's Troll West gas province, contributing to energy security to Europe in the long-term.

The Johan Castberg FPSO left the dock for inshore testing and is on track for sail away to the Barents Sea later in the third quarter.

The feed-gas for Equinor's Hammerfest LNG export plant in

Northern Norway comes from the Barents.

Equinor also closed its swap transaction to increase profitability in the US onshore business by exiting an operated position in Ohio and increasing its position in partner-operated assets in Northern Marcellus Shale in Pennsylvania.

Equinor also accessed CO2 storage capacity opportunities of 17 million tonnes per year with the award of three new licences for Kinna and Albondigas on the NCS, and the Kalundborg licence onshore Denmark.

In the UK, construction is progressing on the Dogger Bank A offshore wind farm with 27 turbines either fully or partly installed.

That project targets full commercial operations during the first half of 2025.

**EUROPEAN PROSECUTOR'S OFFICE (EPPO)** in Nicosia (Cyprus) has started an investigation into the Cypriot Vassiliko offshore LNG terminal project.

An investigation has been opened, the EPPO said, due to a suspicion of





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procurement fraud, misappropriation of EU funds and corruption.

The project was meant to open an entry point for natural gas into Cyprus, enabling the country to connect with the wider European gas market.

It is costed at €542 mill – of which about €101 mill was financed by the Connecting Europe Facility (CEF) programme and the terminal should have been completed in December, 2019.

The investigation was initiated following the publication on 19th January, 2024 of a report by the Cypriot Audit Office, which claimed possible violations during the procurement procedure and the subsequent execution of the public contract.

The European Court of Auditors and the European Climate, Infrastructure and Environment Executive Agency (CINEA) also sent reports to EPPO.

After receiving the information and examining the documents in detail, the EPPO decided to open an investigation, in order to look into the contracts awarded by the public authorities, the organisation explained.

No further details will be made public at this stage, the EPPO said.

EPPO is the European Union's independent public prosecution office. It is responsible for investigating, prosecuting and bringing to judgement crimes against the financial interests of the EU.

**FREEPORT** LNG, the US export facility, was due to return to full production on Sunday.

It pulled over 2 bill cu ft of natural gas, LSEG data showed, according to newswires.

Freeport LNG is the US' second largest LNG exporter and one of the world's most watched US LNG export plants, as it has a history of influencing global gas prices whenever it shuts and restarts.

The plant was shut down on 7th July ahead of Hurricane 'Beryl' and has recently been slowly increasing feedgas demand, according to LSEG.

Two weeks ago, Freeport said it had planned to restart its plant one processing train at a time, as it conducted repairs to the hurricane damage suffered.

Freeport had not officially confirmed the full restart, at the time of writing.

**GAIL** (India), India's largest natural gas entity, state-owned GAIL (India), reported revenue from operations of Rs33,692 crore in the first quarter of its 2025 fiscal

year, compared to Rs32,227 crore in FY1Q24.

Profit after tax (PAT) was Rs2,724 crore, as against Rs1,412 crore in the same quarter of the last fiscal year.

On a quarter-on-quarter basis, revenue from operations was higher at Rs33,692 crore in FY1Q25, as against Rs32,335 crore in 4Q24.

Net profit increased by 25% to Rs2,724 crore, as against Rs2,177 crore in the same quarter of FY24, mainly due to increased gas transmission volumes, increased domestic natural gas marketing volume and improved natural gas marketing margins.

On a consolidated basis, revenue from operations stood at Rs34,822 crore in FY1Q25, as against Rs32,833 crore during FY 4Q24. Net profit (excluding non-controlling interest) was Rs3,183 crore, as against Rs2,469 crore in FY4Q24.

Shri Sandeep Kumar Gupta, GAIL's Chairman & Managing Director, said that, the company had incurred a Capex of about Rs1,659 crore during the current quarter, mainly on pipelines, petrochemicals, equity to joint ventures, etc, which was about 21% of annual target of Rs8,044 crore.

He revealed that GAIL had advanced its net zero carbon target for Scope 1 and Scope 2 emissions to 2035 from the earlier 2040.

**GALP** Energia, the Portuguese oil and gas company which recently agreed to sell its 10 percent stake in the Mozambique LNG project, posted higher adjusted second-quarter net profits.

GALP said the net earnings increased by 16 percent to €299 million (\$325M) compared with €258M in the same three months of 2023.

The Lisbon-based company said that first-half revenues edged higher in 2024 to €1.788 billion from €1.781Bln in the same period of 2023.

GALP had agreed in May 2024 to sell its Area 4 concession in the Rovuma Basin of Mozambique operated by Italy's Eni to Abu Dhabi National Oil Company (ADNOC), the main energy operator in the United Arab Emirates.

That transaction, valued at more than \$1Bln with contingences, entitles 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-South 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.

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

"The revenues reflect a robust operating performance during the period, and now exclude any contribution from Coral South FLNG in Area 4, Mozambique," GALP explained in the second-quarter earnings statement.

The company's supply and trading volumes of natural gas and LNG reached 10.9 terawatt hours in the quarter and were lower than a year ago, reflecting the end of a supply contract with a power generation facility.

GALP operates the Sines LNG import terminal and there is an adjacent oil refinery which processed 23.5 mboe in the second quarter.

Chief Executive Filipe Crisóstomo Silva said the company continued to deliver a robust performance during the second quarter despite "the still volatile commodity price" environment.

"This performance, together with our continual disciplined capital allocation, further strengthened our financial position," added Silva.

"During the period, GALP completed the Angolan upstream asset disposal and announced the divestment from Area 4, in Mozambique. These actions allow us to crystalize value, reduce risk and focus on higher return projects aligned with GALP's strategy," the CEO declared.

Among other quarterly highlights, GALP's share of oil and gas production from upstream projects in Brazil fell 5 percent to 106,000 barrels of oil equivalent per day.

Net capital expenditure totalled €61M and was mostly directed towards upstream projects under development in Brazil, namely the Bacalhau oil field in the Santos Basin and to the initial exploration and appraisal campaign in Namibia, in southwest Africa, while accounting with the proceeds collected from divestments completed during the period at Angola upstream.

GALP completed an agreement during the second quarter for the sale of its upstream assets in Angola with the proceeds to date amounting to €790M including the 2024 contingent payment and contractual adjustments.

The company said that free cash flow amounted to €838M with net debt down

17 percent compared with the end of 2023.

In its outlook, GALP revised some of its key operating and financial guidance for 2024 to reflect the exclusion of Coral South's FLNG contribution and the performance during in the first half of 2024.

**GASUNIE**, whose network and assets include over 17,000 kilometres of pipelines in the Netherlands and Germany as well as stakes in Dutch and German LNG import facilities, reported a plunge in first-half earnings as the Dutch continued to show dependence on LNG amid the green obsessions and over-regulation of the European Union.

The Groningen-based utility's net profits tumbled to €95 million in the first six months of 2024 from €266M in the same period of 2023.

Gasunie's first-half revenues declined to €696M from €1.10 billion in the 2023 first half.

"Gasunie recorded €171M less in net profit and €407M less in revenue in the first half and most of the decline can be attributed to the regulatory system Gasunie is facing in the Netherlands and Germany," the company declared.

Gasunie noted that the EemsEnergy Terminal for LNG at the port of Eemshaven in Groningen has been operational since September 2022 and has welcomed over 100 LNG deliveries.

"The rapid development of the EemsEnergy Terminal is considered to be one of the most important and successful projects in Europe to reduce dependence on Russian pipeline gas," Gasunie said.

The terminal was initially contracted for a period of five years, though Gasunie and Dutch partner Vopak, the global storage giant, are now investigating whether, for the sake of energy security and the energy transition, the terminal should remain in operation longer.

"The results of this investigation may result in an 'open season', where the required capacity is offered to the market in a transparent manner," Gasunie added in the earnings statement.

Gasunie in the Netherlands transmitted 322 terawatt hours (TWh) of natural gas in the first half of 2024, which is 14 percent less than the 377 TWh transmitted in the first half of 2023.

The utility said that this was the lowest volume Gasunie has ever transmitted and followed the cessation of natural gas production at the Groningen gas field, the nation's largest.



At present, the Netherlands depends on gas imports to meet roughly 75 percent of its energy demand.

“As LNG imports are expected to continue to be needed over the coming years, the LNG terminal is set to play a key role in the transition to renewable energy,” the company added.

Gasunie’s German subsidiary, Gasunie Deutschland (GUD) GmbH, transmitted 127 TWh of natural gas, down 8 percent on the 139 TWh transmitted over the first half of 2023.

“Thanks to the new LNG import facilities in Brunsbüttel, GUD recently transported domestic regasified LNG through its pipelines for the first time,” the company explained.

Gasunie stated that LNG from overseas made up 29 percent of the company’s natural gas supply along with pipeline gas volumes.

Pipeline volumes from Norway made up a further 16 percent, Belgian pipeline gas 10 percent, United Kingdom gas 3 percent, German gas 3 percent and supplies from German gas storage 3 percent.

A further 17 percent come from smaller gas fields, 15 percent from Dutch gas storage and 4 percent was nitrogen.

In the first half, Gasunie blended 122 TWh of high-calorific gas (H-gas) with nitrogen to produce low-calorific Groningen-quality gas (pseudo G-gas).

This was 20 percent less than in the first half-year of 2023 (152 TWh) and is due to decreased demand for pseudo G-gas.

The amount of nitrogen used for conversion decreased from 1.6 Bcm to 1.3 Bcm.

Gasunie Deutschland’s gas transmission network is linked to those of other German Transmission System Operations.

The entry volumes are GUD’s share in the volumes stated in the “nominations” (i.e. shipper’s requests) at the entry points.

In the first half of 2024, GUD also received small amounts of imports from Denmark (0.3 TWh) as well as domestic biomethane (0.04 TWh).

Gasunie since March 2024 has been under a new Chief Executive and Board Chairwoman, Willemien Terpstra.

She succeeded Han Fennema, who stepped down in November 2023 after nearly 10 years at the helm.

“In the first half of 2024, we provided a high level of transmission security for our customers in the Netherlands,” Gasunie said.

“There was one transmission interruption, at an interconnection point with the Belgian grid operator Fluxys, which fortunately did not cause any problems, thanks to timely communication with Fluxys,” the company added.

**GOLAR LNG** and bp, as operators of the Mauretania/Senegal Greater Tortue-Ahmeyim LNG project, have signed agreements to implement a commercial reset for the FLNG ‘Gimi’.

This commercial reset agreement simplifies contractual cash flows and settles previous disputes related to payment mechanisms for pre-commercial operations date (pre-COD) contractual cash flows.

Golar and bp have agreed an updated schedule of daily payments until the commercial operations date (COD), which have step-up mechanisms based on project milestones up to COD and are secured by long stop dates.

Golar will also be entitled to certain lump sum bonus payments subject to achievement of certain project milestones.

These pre-COD cash flows are expected to be deferred on the balance sheet and amortised over the 20-year contract term from COD.

This commercial reset settles all ongoing disputes, including the current arbitration process and re-aligns the parties towards reaching COD, Golar said.

To shorten the time to COD, the parties have also agreed to start the commissioning of FLNG ‘Gimi’ with an LNG cargo prior to the availability of gas from the FPSO.

**GTT**, the French maritime LNG storage technology company, has received an order from its partner, the South Korean shipyard Samsung Heavy Industries (SHI), for the storage tank design for a floating unit ordered by Canada’s Cedar LNG project in British Columbia.

GTT will design the tanks of this FLNG, which will have a total storage capacity of 180,000 cubic metres and will incorporate the Mark III Flex membrane containment system developed by GTT.

The delivery of the FLNG unit for the Cedar joint venture is scheduled for the first quarter of 2028.

Pembina Pipeline Corp., the Canadian natural gas and energy transportation and terminals company, and its Cedar floating LNG partner, the Haisla First Nation, reached a positive investment

decision in June 2024.

The Cedar project with nameplate capacity of 3.3 million tonnes per annum will be on Haisla traditional territory on the near-shore of Douglas Channel near Kitimat.

The engineering, procurement and construction contractors for Cedar LNG are Korea’s SHI and US firm Black and Veatch, based near Kansas City in Missouri.

Cedar LNG is majority-owned by the Haisla Nation in partnership with Pembina with 50.1 percent and 49.9 percent ownership respectively.

The project is expected to be funded with asset-level debt financing for 60 percent of the project cost.

Cedar LNG has already secured a construction term loan from a syndicate of banks.

The remaining 40 percent of the costs of the project are expected to be financed through equity contributions from both partners.

The Haisla Nation has obtained committed capital through the First Nations Finance Authority to fund their 20 percent equity contribution to the project.

Cedar LNG has received strong support from domestic and international capital providers, reflecting the positive merits of the project.

Pembina has also completed a 20-year take-or-pay liquefaction tolling services agreement with a fixed toll signed with Canadian energy company ARC Resources.

ARC Resources has operations focused in the Montney shale-gas play in northeast BC and the tolling agreement is for 1.5 MTPA of LNG.

**HINDUSTAN PETROLEUM CORP (HPCL)**, India’s state-owned oil and gas entity, is negotiating long term LNG import contracts.

The imports will feed its new 5 mill tonnes per annum Chhara terminal, due to come online by the end of this year.

Speaking at HPCL’s second quarter earnings results yesterday, Finance chief Rajneesh Narong, said: “We will be undertaking commissioning activity in November or December, depending on the weather conditions.

“We are in the market for tying up long term gas from international players,” he said.

An April attempt to open the terminal was thwarted by bad weather. A breakwater is currently under

construction to protect the terminal.

He also revealed that HPCL would consider leasing some of the terminal’s capacity to other interests

The Chhara terminal will supply gas to two existing refineries in the region, as well as to a new 180,000 barrels per day refinery and petrochemical complex in Rajasthan State.

**INDIAN** liquefied natural gas imports rebounded by more than 11 percent in June even at higher prices after last month’s decline as internal gas demand also increased along with domestic production.

LNG imports for the month of June amounted to 1.96 million tonnes, or 29 cargoes, compared with 1.76MT, or 26 cargoes, in June 2023, an increase of 11.3 percent, according to preliminary data from the Ministry of Petroleum and Natural Gas.

LNG imports for the month of May had also come to 1.96MT compared with 2.11MT in May 2023, a decrease of 7.2 percent.

The deliveries for the first three months of the fiscal year so far from April to June edged higher by 0.7 percent to 5.77MT versus 5.73MT in the prior-year period.

Data showed that LNG deliveries in June 2024 cost \$1.1 billion which was 10 percent higher than the \$1Bln paid in June 2023.

Deliveries of LNG to India’s growing number of regasification terminals came from Qatar, which provides over one-third of volumes, as well as West Africa, the US, Russia Asia-Pacific nations and the spot market.

India’s eighth LNG import terminal, the Chhara facility in the West Coast state of Gujarat, received its commissioning cargo in April 2024.

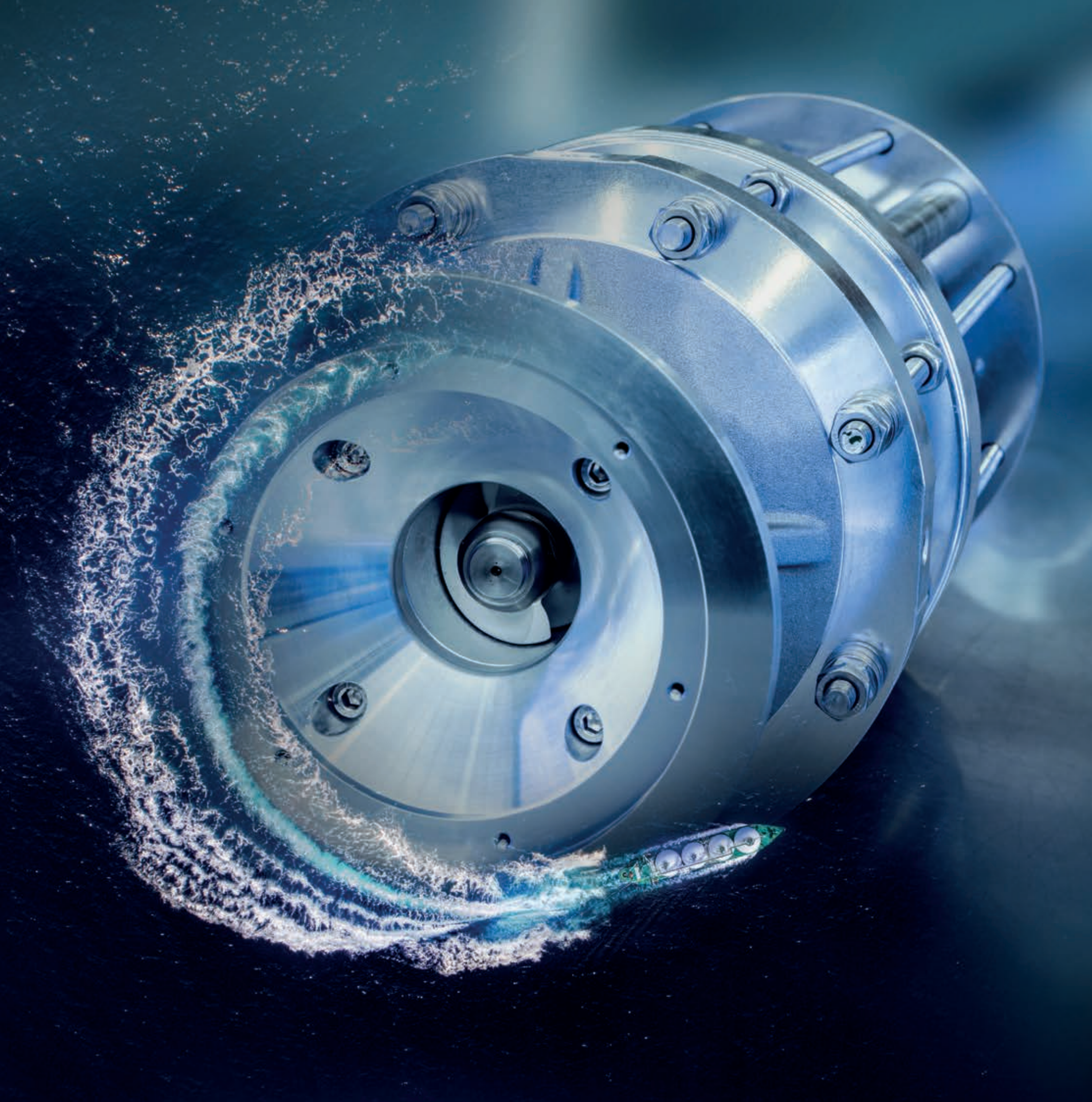
The Chhara terminal has 5 million tonnes per annum of capacity and has been developed by Hindustan Petroleum Corp.

The Indian Ministry data showed that India’s domestic natural gas production for the month of June rose by 2.9 percent to 2.993 billion cubic metres versus the 2.910 Bcm reported in June last year.

In the three months of the current fiscal year so far, natural gas output increased by 5.7 percent to 9.056 Bcm, up from 8.564 Bcm in the same period of 2023.

Reliance Industries, the Indian group with significant energy interests, started up a third gas field in the Krishna





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Godavari Basin KG-D6 block on the East Coast a year ago in a joint venture with BP of the UK.

India's production of coal-bed methane (CBM), which in Australia is used to produce LNG, also increased in June to 59.63, up from 58.60 Bcm in May was at 173.10 Bcm for the first three months of the fiscal year.

The Ministry also gave average capacity utilization rates for seven LNG terminals and with data covering the period from April 2024 to May 2024.

The total capacity of existing terminals has now risen to 52.7 MTPA from the eight facilities.

However, the Chhara LNG terminal will take several months to appear in the Ministry regasification 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 of 107.2 percent of nameplate capacity in the period, up from 101 percent in May.

At the Hazira facility, operated by Shell India, the utilisation rate increased to 38.3 percent from 28.6 percent in May for 5.2 MTPA of capacity.

The GAIL (India) terminal at Dabhol, south of Mumbai, reported 73.8 percent usage, up from 69.9 percent last month for its 5 MTPA.

The West Coast terminal at Mundra belonging to Gujarat State Petroleum Corp. had regas levels at 34.4 percent up from 33.8 percent in May and its highest ever for 5 MTPA.

At the Kochi facility owned by Petronet in the southwest state of Kerala usage fell to 20.6 percent from 20.9 percent last month for 5 MTPA of regas capacity.

The Kamarajar (Ennore) terminal owned by Indian Oil on the East Coast, saw capacity rise to 25.8 percent from 25.6 last month for 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 25 percent in the April-May period, down from 26.9 percent for its 5 MTPA.

The Ministry data also showed that the nation had a total of 23,560 kilometres of natural gas pipelines in operation and another 5,630km was currently under construction.

GAIL India had the longest network of 15,916km of pipelines and a distant second place was occupied by the Gujarat State pipelines group and its 2,722km of pipelines.

India's natural gas consumption for

June was 5.594 Bcm, an increase of 7.1 percent from 5.224 Bcm in June 2023.

Consumption for the April-to-June period was 16.707 Bcm, up by 3.8 percent compared with the 16.101 Bcm logged in the same period of 2023.

The major Indian consumers of natural gas 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 increased marginally in June even at higher prices, though the half-year figures showed a downward trend for 2024.

Japan's network of 37 terminals handled 4.56MT, or 67 cargoes, in June 2024. This was increase of 0.6 percent from the June 2023 total of 4.53MT, or 66 cargoes, according to preliminary Finance Ministry data.

Deliveries to Japan in May had come to 4.87MT, up 5.6 percent on the 4.62MT received in May 2023.

The cost to Japan of the June cargoes was 424.91Bln (\$2.70Bln), an increase of 8.1 percent from the 392.91Bln yen (\$2.50Bln) paid in June last year.

Thermal coal imports, a competitor to LNG for electricity generation, fell by 6.9 percent in June 2024 to 6.75MT and costs were 28.6 percent lower from June 2023 at 161.14Bln yen (\$1.026Bln).

Japan's half-year LNG import total from January to June 2024 were down by 0.7 percent to 32.41MT from 32.62MT in the first six months of 2023.

The cost of the half-year LNG deliveries was down by 9.9 percent to 3.094 trillion yen (\$19.71Bln) compared with the 3.435 trillion yen (\$21.88Bln) paid in the same period last year.

Thermal coal imports in the half-year period dropped by 11.7 percent to 49.41MT but the costs for the six-month period were up by 20.2 percent to 2.041 trillion yen (\$13.00Bln).

Imports of LNG from the US for the first six months of 2024 increased by 34.2 percent and totalled 2.84MT, while imports from Russia were down by 3.3 percent but were more at 2.99MT.

The data from the Finance Ministry showed that deliveries of LNG from Asian nations like Malaysia and Indonesia amounted in June to 817,000 tonnes and were down by 11.1 percent from June 2023.

Deliveries from countries in the Middle

East like Qatar rose by 2.2 percent in June 2024 to 451,000 tonnes.

Imports from the US totalled 504,000 tonnes and were lower by 2.6 percent compared with June 2023.

Cargoes sent from Russia's Sakhalin Island plant in the Far East rose by 13.6 percent to 552,000 tonnes.

The balance of the shipments to Japan in June 2024 came mainly from Australia and the spot market and amounted to 2.23MT, higher than the May 2024 total of 2.05MT.

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

The Government in Tokyo is keen on accelerating the restart of nuclear reactors to mitigate power costs, secure a stable energy supply and further reduce greenhouse-gas emissions.

**KINDER MORGAN (KMI)**, the leading US pipeline feed-gas company for liquefied natural gas plants and a key energy infrastructure operator and developer, posted solid first-quarter earnings and forecast a surge through 2030 of LNG exports and pipeline gas deliveries to Mexico.

KMI reported steady second-quarter net income and higher profits for the first six months of 2024.

The Houston, Texas-based company posted \$602 million of quarterly net income compared with \$610M in the same three months of 2023.

Net profits from January-to-June 2024 came to \$1.37 billion, up from \$1.31Bln in the first half last year.

KMI Chief Executive Kim Dang said the company had a "solid second quarter" with increased financial contributions from the Natural Gas Pipelines, Products Pipelines and Terminals business divisions.

"Notwithstanding the current low-price environment for natural gas, the future looks very bright for our Natural Gas Pipelines business," stated Dang.

"We expect demand for natural gas to grow substantially between now and 2030, led by more than a doubling of demand for LNG exports and an almost 50 percent increase in natural gas exports to Mexico," said the CEO.

KMI's second-quarter revenues increased to \$3.57Bln versus \$3.50Bln in the same quarter of 2023.

"We continued to internally fund high-quality capital projects while generating cash flow from operations of \$1.7Bln and

\$1.1Bln in free cash flow after capital expenditures," said Executive Chairman Richard D. Kinder.

"As a leader in the midstream sector with an extensive, interconnected network of fee-based assets in the energy infrastructure space, we are proud to play a significant role in maintaining energy security for the United States," explained the Chairman.

"Furthermore, through our large and growing support to the liquified natural gas sector, including our own export facility at Elba Island (Georgia), we are also playing a key role in providing energy security to countries around the world," Kinder declared.

CEO Dang said that one example of opportunities to meet this demand growth was the successful binding open season just concluded for the proposed South System Expansion designed to increase Southern Natural Gas (SNG) Pipeline's South Line capacity by 1.2 billion cubic feet per day.

"Once completed following receipt of all required approvals, the project will help meet growing power generation and local distribution company demand in the Southeast markets," Dang said.

KMI said that the project backlog at the end of the second quarter was \$5.2Bln, up from \$3.3Bln in the first quarter.

"We are devoting approximately 80 percent of our project backlog to lower-carbon energy investments, including conventional natural gas, renewable natural gas (RNG), renewable diesel (RD), feedstocks associated with RD and sustainable aviation fuel (SAF), as well as carbon capture and sequestration," Dang added.

KMI President Tom Martin gave an overview of each division and said that The Natural Gas Pipelines segment benefited from higher contributions from the Texas Intrastate system as well as additional contributions from the STX Midstream acquisition.

"Natural gas transport volumes were up slightly compared to the second quarter of 2023. Natural gas gathering volumes were up 10 percent from the second quarter of 2023, primarily from our Haynesville and Eagle Ford gathering systems," Martin said.

"Contributions from the Products Pipelines business segment were up compared to the second quarter of 2023 due to higher rates on existing assets and contributions from new capital projects," the KMI President added.



“The Terminals business earnings were up and the liquids terminals benefited from expansion projects placed in-service as well as higher rates and utilization at our New York Harbor hub facilities,” said Martin.

He said that the bulk business benefited from increased coal, petroleum coke and soda ash volumes.

“Higher rates on our Jones Act tankers, which remain fully contracted under term charter agreements, also contributed to the segment’s performance for the quarter,” Martin concluded.

**MET** Group, the Swiss-based energy trader, has signed a €1.1 bill borrowing base facility (BBF) for its Sales and Trading operation.

This loan demonstrates the confidence of banking partners in MET’s integrated business model, the company claimed.

It was structured and led by ING Bank, as co-ordinator, security and facility agent, joined by Coöperatieve Rabobank, Natixis CIB and Société Générale, as active bookrunning mandated lead arrangers, which were backed by a pool of 13 additional international banks.

The facility includes an accordion option to increase the amount up to a maximum of €1.7 bill, to allow MET to accommodate further volume growth, or changes in market structure and environment.

MET’s experience in recent years clearly demonstrated the importance of adequate, scalable and efficient funding solutions in gas, LNG and power trading, it explained.

As a main financing vehicle of MET’s sales and trading operation, the funds will particularly supporting LNG imports, the storage and sale of natural gas in Europe and beyond.

Sven Kirch, MET Group’s CFO, commented: “I am very pleased with the outcome of our new borrowing base facility and the terms we have achieved with the pool of our banking partners.

“The BBF is reflective of the progress MET has made not just in terms of financial strength but also continues to recognise the clarity of our approach to risk management and the growth trajectory we continue to be on.

“We are looking forward to building on our track record and playing our role in resolving the energy trilemma of energy security, de-carbonisation and cost,” he said.

**NAKILAT** (Qatar Gas Transportation Co) and its subsidiaries have revealed a net profit of QAR829 mill for the first half of this year, compared to QAR775 mill for the corresponding period in 2023, an increase of 7%.

This robust financial performance highlights Nakilat’s resilience and its strategic capabilities in dealing with the dynamic economic landscape, the Qatari company claimed.

At a forthcoming Extraordinary General Assembly meeting, the Board will propose to distribute interim cash dividends for the period at a rate of (7%) of the capital, equivalent to QAR0.07 per share, and to approve the amendment of the company’s Articles of Association.

During the first half of this year, Nakilat incurred total expenses of QAR1,461 mill, a decrease of 4%.

Significant milestones were also recorded in Nakilat’s fleet expansion project this year, as the company signed contracts to build six advanced gas carriers, including two LNGCs and four modern LPG/Ammonia carriers.

Long-term contracts were also signed with QatarEnergy to charter and operate nine QC-Max LNGCs, each with a capacity of 271,000 cu m, plus 25 conventional LNGCs, each with a capacity of 174,000 cu m.

These new vessels will be built and delivered according to the scheduled timeline over the coming years.

Nakilat said that this initiative reflects its commitment to modernisation and innovation in maritime transport services, aiming to meet the growing demand in the global energy shipping sector.

Upon their completion, Nakilat’s fleet will total 114 ships, reinforcing its global leadership in the clean energy transport sector.

Eng Abdullah Al-Sulaiti, Nakilat’s CEO, commented: “We remain committed to building a future with sustainable approaches and providing secure and reliable energy transportation solutions as demand for the LNG transportation market is expected to increase worldwide.

“2024 is a milestone year for Nakilat’s expansion projects, and our latest financial results, with an increase in net profit by 7%, is a testament to the company’s two decades of global operational excellence in maritime services,” he said.

**NOVATEK**, the Russian natural gas company and operator of the Yamal LNG export plant and developer of the delayed Arctic LNG 2 venture, has reported

positive operating data for the second quarter of 2024 amid continued Western sanctions.

Novatek said second-quarter 2024 total natural gas sales volumes to the end of June, including LNG, came to 20.60 billion cubic metres compared with 20.35 Bcm in the same three months of 2023, representing an increase of 1.2 percent.

Novatek’s hydrocarbon production totaled 163.3 million barrels of oil equivalent (boe) in the second quarter, up by 2.8 percent from 158.9 million barrels equivalent in same quarter last year.

Preliminary total natural gas sales volumes, including volumes of LNG sold, in the second quarter and first half 2024 amounted to 17.83 Bcm and 39.30 Bcm respectively, resulting in a decrease of 2.6 percent and 3.3 percent compared with the second quarter and first half of 2023.

While cargoes from the Yamal plant have also been sent to Asia, most of the shipments have been unloaded in European Union nations or trans-shipped.

The UK is the only LNG importer in northwest Europe to formally ban LNG from Russia.

The main EU destinations for Russian LNG in the first half of 2024 have been Belgium, the Netherlands, France and Spain.

Novatek said first-half 2024 hydrocarbon production totalled 330.7 million boe, including 41.73 Bcm of natural gas and 6.8MT of liquids, resulting in an increase in total hydrocarbons produced by 8.8 million boe, or by 2.7 percent compared with the first half of 2023.

Preliminary total sales volumes of liquid hydrocarbons in the second quarter and first half 2024 amounted to 4.0MT and 8.3MT, which was 2.5 percent and 7.0 percent higher than in the second quarter and first half 2023.

As of the end of June 2024, Novatek said it had 0.8 Bcm of natural gas, including LNG, and 1.5MT of stable gas condensate and petroleum products in storage.

While Novatek is boosting domestic production, it has been seeking new markets for its gas after Western sanctions stalled the Arctic 2 LNG joint venture on the Gydan Peninsula of Northern Siberia.

However, Gazprom, the Russian rival to Novatek, has been harder hit by Western sanctions over Ukraine because of the shutdown of pipeline gas deliveries to the EU.

Novatek’s Arctic LNG 2 project has

had several gravity-based structures (GBSs) completed, though the US imposed more sanctions in November 2023 affecting technology transfers.

Some LNG production testing started in December 2023 at the first Train of the Arctic LNG on the Gulf of Ob, though Novatek has failed to ship any cargoes so far after reported problems with the liquefaction processing.

The second and third liquefaction Trains were now delayed as well.

The Arctic LNG Trains and facilities are being pre-built at a fabrication yard in the Murmansk region of Russia and placed onboard GBSs to be towed to the Gydan Peninsula project site.

Each Arctic LNG liquefaction Train installed on the platforms will have production capacity of 6.6 million tonnes per annum to total almost 20 MTPA in nameplate capacity.

A total of around 90 natural gas wells have been completed at the Utrenneye gas field to provide feed gas for Arctic LNG.

**NOVATEK** has floated out a second Arctic LNG 2 module from the Belokamenka shipyard near Murmansk.

The giant module was towed out on 25th July by a fleet of tugs and offshore vessels, the Russian business daily Kommersant reported.

Measuring 300 m x 128 m and at 540,000 tonnes, the platform has started its 1,300 nautical mile voyage under tow to the Arctic LNG 2 site off the Gydan Peninsula.

There was thought to be a heavy Russian military presence, both in the air and at sea, in the Kola Bay area to guard against possible sabotage, especially from Ukrainian drones.

“In the interests of ensuring the safety of the floating modular plant, timely detection and suppression of possible sabotage and terrorist threats, a procedure for interaction during anti-terrorist exercises and training, as well as during counter terrorist operations has been developed and approved,” the FSB press service reported.

It was also reported that it will take around three weeks to tow the platform through the Barents and Kara Seas to the Utrenney terminal site on the Gydan peninsula.

**OSAKA GAS**, a Japanese utility, has signed a long-term heads of agreement (HoA) with ADNOC for the delivery of up to 0.8 mill tonnes per annum of LNG.

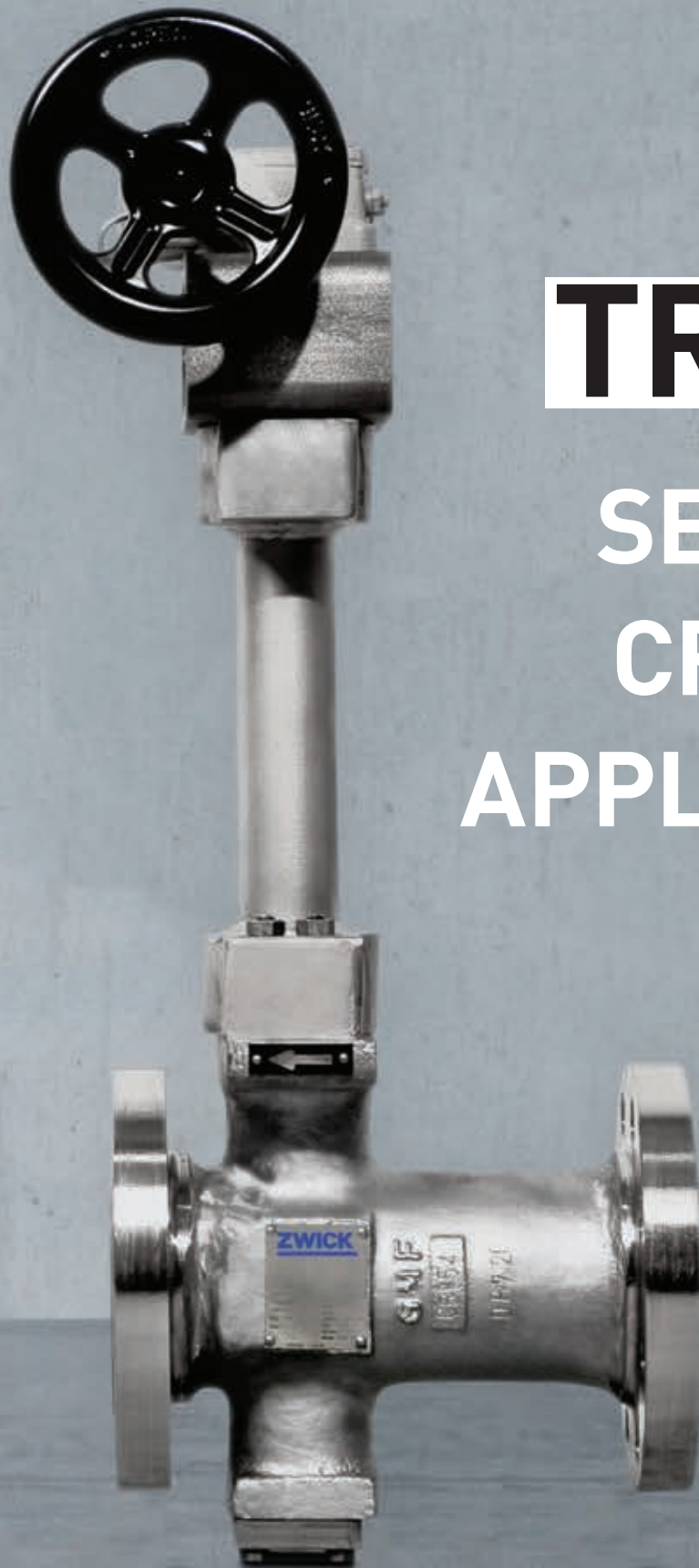


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This marks the first long-term LNG deal between the two companies.

The LNG will be mainly sourced from the Ruwais LNG project, which is currently under development in Al Ruwais Industrial City, Al Dhafra, Abu Dhabi, which is expected to start commercial operations in 2028.

Under the terms of the agreement, LNG cargoes will be shipped to Osaka Gas' terminals and those of its Singapore-based subsidiary, Osaka Gas Energy Supply and Trading (OGEST).

Osaka Gas and ADNOC said that they will work together to conclude a detailed sale and purchase agreement (SPA) in the coming months based on the terms of the HoA.

Keiji Takemori, Osaka Gas Executive Vice President, said: "Osaka Gas is delighted to secure LNG from ADNOC, a reliable supplier in the Middle East. This contract with ADNOC will significantly enhance the stability of Osaka Gas' LNG procurement. It will also strengthen the foundation of our stable energy supply to customers, transition to lower carbon energy, and acceleration toward our net zero target.

"These align with our goals in the Medium-Term Management Plan 2026: Connecting Ambitious Dreams, which we announced in March. We will continue working on the stable procurement, development, and supply of natural gas as a key transition fuel to achieve a carbon neutral future," he said.

Rashid Khalfan Al Mazrouei, ADNOC Senior Vice President, Marketing, added: "This landmark LNG agreement, our first long-term LNG deal with Osaka Gas, underscores the strong, long-standing energy partnership between the UAE and Japan.

"This agreement further enhances ADNOC's position as a reliable and responsible global energy provider and reflects our commitment to help meeting Japan's growing energy needs with secure and sustainable energy solutions.

"The Ruwais LNG project supports our broader strategy to expand our global LNG footprint to enable the energy transition," he said.

**OMAN LNG** is to receive another LNG train, which will be developed at the Qalhat Industrial Complex in Sur.

Oman's Ministry of Energy and Minerals said that the new liquefaction train, with an annual production capacity of 3.8 mill tonnes, will raise the country's LNG production capacity to 15.2 mill

tonnes per year, according to an Omani news agency report.

It was reported that the new train will improve operational efficiency and maximise the benefit from the existing infrastructure of Oman LNG Co.

Its construction is expected to be completed and operational by 2029, the report said.

Oman's government is to proceed with the completion of the initial engineering design study for the new LNG train, which is expected to pave the way for making the final investment decision (FID) for the project.

H E Eng Salim bin Nasser al Aufi, Minister of Energy and Minerals, reportedly said, "The plan to launch a new train represents a pivotal addition to the strategy adopted by the sultanate to sustain its position as an important supplier and a major, safe, and reliable source of energy globally."

He explained that the new LNG train will be built alongside the current trains at the Qalhat LNG complex, which will enhance the ability to meet the increasing demand for LNG in the global market.

**PETRONAS** has asked some of Malaysia LNG Tiga project's offtakers to defer cargo loadings from the Bintulu terminal in August by more than a week.

According to S&P Global Commodity Insights, other offtakers of the project also received requests to defer LNG cargo loadings by several days, sources said.

They attributed LNG cargo deferments to a recent problem with a heat exchanger, which affected at least one train at the Petronas-operated MLNG Tiga's Train 7 and 8.

"Not sure the exact issues that Bintulu is experiencing but Petronas is trying to exercise minimum tolerance," one trader said.

Petronas did not respond to a request for comment to S&P Global.

The possibility of LNG cargo deferments comes in the middle of peak summer power demand in Northeast Asia, where maximum temperatures have been hovering well above 30 deg C in recent weeks.

MLNG Tiga's Train 7 and Train 8 export around 84-88 cargoes in total each year, or more than half a dozen cargoes per month.

Most of the cargoes go to Japan, to utilities, such as Osaka Gas, Toho Gas, Tohoku Electric, Tokyo Gas, as well as CNOOC in China and South Korea's KOGAS, LNG shipping brokers said.

Shipments have been deferred, not cancelled, they stressed.

Bintulu LNG has three trains each at MLNG and MLNG Dua, two trains at MLNG Tiga and a ninth train operated by Petronas, giving the complex nearly 30 mill tonnes per year of capacity.

The Malaysia LNG-chartered, 'Puteri Nilam' left the Bintulu terminal on 5th August and is estimated to arrive in Incheon on 23rd August, according to S&P Global Commodities at Sea data.

She followed the departure of the Petronas-chartered 'Lagenda Serenity', which sailed from Bintulu on 1st August and is due to arrive at Shanghai on 7th August, according to CAS.

Asian LNG prices fell on 5th August amid muted spot LNG demand in the East Asia region, despite the rising temperatures.

Platts, part of Commodity Insights, assessed JKM, the benchmark price for Northeast Asia, for September at \$12.772 per MMBtu on 5th August, down 1.11% on the day.

**RELIANCE** Industries, the group with growing natural gas and oil and chemicals businesses, reported increased overall fiscal first-quarter revenues while net income slipped amid moves to boost the nation's domestic output with more exploration and production to offset LNG and oil imports.

Reliance reported that overall first-quarter 2024-2025 fiscal year revenues from its multiple business divisions, from tech and retail to natural gas and oil refining, increased by 11.6 percent to 257,823 crore Indian rupees (\$30.9 billion) compared with 231,132 crore rupees (\$27.60Bln) the same quarter of 2023.

Reliance reported a decline of 4 percent in fiscal first-quarter net profits to 17,448 crore rupees (\$2.10 billion) compared with the 18,182 crore rupees (\$2.17Bln) reported in the same three months of fiscal 2023-2023.

Overall gross earnings for the three months increased by 2 percent year-on-year to 44,678 crore rupees (\$5.1Bln) versus 41,906 crore rupees (\$5.0Bln) in the prior-year quarter.

Reliance, based in Mumbai, is one of the leading Indian conglomerates also involved in textiles, retail, telecoms and media and other business as well as energy.

In the oil and gas exploration and production division quarterly revenues amounted to 6,179 crore rupees (\$737.8

million), up 33.4 percent year-on-year.

Quarterly gross earnings from the Indian E&P sector for Reliance came to 5,210 crore rupees (\$622.1M), up 29.8 percent from the prior-year quarter.

Revenues were helped mainly by higher volumes from the Krishna Godavari Dhirubhai 6 (KG-D6) block offshore Eastern India in the Bay of Bengal, partly offset by lower price realisations from KG-D6 and coal-bed methane.

The KG-D6 block was India's largest natural gas find and the largest such discovery in the world for that year when it was found in 2002.

"The average price realised for KG-D6 gas was \$9.27 per million British thermal units in 1Q vis-à-vis \$10.81 per MMBTU in 1Q FY24," said Reliance.

"The price realised for coal-bed methane was \$11.59 per MMBtu in 1Q FY25 vis-à-vis \$14.15 per MMBTU in 1Q FY24," the company added.

Reliance said Block KG-D6 production was currently running at 28.7million standard cubic metres per day of natural gas and 21,640 barrels of condensate.

Reliance has CBM assets in the Mahanadi Basin as well as two blocks at Sohagpur (East) and Sohagpur (West) in Madhya Pradesh state in central India south of New Delhi.

In the Reliance CBM activities a 40 multi-lateral well campaign is underway to augment production. Of this total 21 wells have been completed with 20 of them currently under production ramp-up.

The current rate of CBM production was 2.3 billion cubic feet equivalent in the first quarter, up 9.5 percent from 2.1 Bcfe in the same quarter of 2023.

In the company's oil and chemicals segment fiscal first quarter revenues surged by 18.1 percent to 157,133 crore rupees (\$18.8Bln)

However, quarterly gross earnings from oil and chemicals fell to 13,093 crore rupees (\$1.7Bln), down by 14.3 percent from the same three months of fiscal 2023-2024.

Reliance said that crude oil benchmarks rose due to continuing production cuts by OPEC+, rising geopolitical tensions in the Middle East and attacks on vessels in the Red Sea.

"Segment revenue increased primarily on account of higher product prices tracking a 9 percent increase in Brent crude oil prices, and higher volumes supported by strong domestic demand," Reliance explained.



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Reliance said that its total refining throughput in the quarter came to 18.6 million tonnes of crude.

“Reliance has delivered yet another quarter of robust operating and financial performance, thanks to the exceptional efforts put in by teams across its businesses,” said Mukesh D. Ambani, Chairman and Managing Director of Reliance.

“Consolidated EBITDA for the quarter improved from a year ago with strong contributions from consumer and upstream businesses,” added Ambani.

“Reliance’s resilient operating and financial performance in this quarter underscores the strength of its diverse portfolio of businesses. Importantly, these businesses are contributing significantly to India’s growth, providing vital energy and vibrant channels for digital and physical distribution of goods and services,” he stated.

**SAIPEM**, the Italian engineer for LNG, oil and pipeline gas subsea contracts, has been chosen to ensure the supervision and any subsea intervention services for the GreenStream gas pipeline linking Libya to Italy and the longest and deepest pipeline ever laid in the Mediterranean Sea.

GreenStream BV, a joint venture comprising Italian oil and gas major Eni and the Libyan National Oil Corporation, awarded the work to Saipem.

The GreenStream system conveys natural gas from coastal facilities at Mellitah in Libya to Gela on the Italian island of Sicily.

Libya is a former LNG exporter but the Marsa el Brega LNG export plant was destroyed during the years of conflict in the North African nation.

The LNG facility was the third to start operations in 1970, after Alaska and Algeria, and exported 3.2 million tonnes per annum from four liquefaction Trains.

As part of the broader and revived Western Libyan Gas Project, GreenStream connects the Mellitah Compression Station, on the Libyan coast, with the receiving terminal in Gela in Sicily where Libyan gas arrives from two fields.

The first gas field, Bahr Essalam, is offshore the Libyan coast and the second, the Wafa gas field, is located in the Libyan desert near the border with Algeria.

The Libya-Italy Mediterranean pipeline has a diameter of 32-inches and is around 520 kilometres (323 miles) long.

GreenStream crosses points near

Malta and with waters depths reaching 1,127 metres.

The Gas Compression Station at Mellitah (MGCS) is beside the Gas Treatment Plant that compresses the gas to be exported and up to the pressure required for the entering the Italian Gas Transport Network.

The latest contract awarded by GreenStream to Saipem is renewing a work programme in force since 2008 that included asset integrity, inspection, maintenance and emergency pipeline services.

“The activities will be managed by Saipem’s center of excellence for robotics, underwater technologies and services, and executed in coordination with the Saipem Engineering Hub located in Fano in Italy,” Saipem added.

“The scope of work streamlines the integrated management of survey data and critical spares, the provision of specialized engineering services related to asset integrity and readiness services for repair interventions in case of a wide range of damage scenarios,” Milan-based Saipem added.

Specifically, repair interventions in case of damage will be performed via a remotely operated repair system and qualified to operate in water depths of up to 2,200 metres.

“With this award Saipem will contribute to managing the integrity of a fundamental underwater infrastructure for the Italian energy supply system,” the company added.

“It also consolidates the long-term cooperation between Saipem and GreenStream BV, which in 2002 awarded the company a contract for the pipelaying of the said pipeline, a project thanks to which Saipem achieved the record for the deepest pipe-laying with anchors,” Saipem concluded.

**SAIPEM**, the Italian engineer for LNG, oil and pipeline gas subsea contracts, reported a rise in earnings as well as a surge in new contracts and revenues, giving the company a backlog of €30 billion (\$33Bln) and signalling an improving energy sector.

The Milan-based company’s revenues in the second quarter amounted to €2.76 billion and for the first six months of the year surge by over 20 percent to €6.42Bln, up from €5.34Bln in the first half of 2023.

Saipem stated that new contracts awarded in the first half came to €7 billion “confirming the strong market demand and the group's competitive

offer”, particularly in offshore activities and large-scale integrated projects.

The net result of the first half of the year stood at €118 million compared with the €40M recorded in the same period of the previous year.

The backlog, equal to more than €30Bln, and the strong commercial pipeline “further improved the visibility of the objectives” of Saipem’s 2024-2027 Strategic Plan.

“In the first half of 2024 Saipem was awarded new contracts amounting to a total of €7.08Bln, up from €6.69Bln in the corresponding period of 2023,” said Saipem.

“The backlog as of June 30, 2024 amounted to €30.47Bln comprising €16.31Bln in Asset-Based Services, €12.49Bln in Energy Carriers and €1.67Bln in Offshore Drilling, of which €6.64Bln is to be executed in 2024,” the company explained.

“The backlog including non-consolidated companies as of June 30, 2024 amounted to €30.62Bln versus €29.89Bln as of December 31, 2023,” Saipem stated.

Saipem listed its most significant contract awards in the second quarter and they included the Kaminho project for French major TotalEnergies in LNG exporting nation Angola.

“This is part of the development of the Cameia and Golfinho oil fields, located around 100 kilometres off the coast of Angola,” said Saipem.

“The scope of works includes engineering, procurement, supply, construction, installation, pre-commissioning and assistance for commissioning and the start-up phase of a SURF (Subsea, Umbilicals, Risers & Flowlines) package, which includes around 30 kilometres of pipelines, risers and umbilicals,” Saipem added.

It also included work for the Azule Energy Angola group for the Ndungu Field project, part of the Agogo Integrated West Hub project located around 180km off the coast of Angola.

The activities concern the engineering, fabrication, transport and installation of around 60km of rigid pipes and subsea structures at a depth of around 1,100 metres and the transport and installation of pipes, flexible connectors and 17km of umbilical cables.

Another second-quarter award on the list is from Saudi Aramco.

“Two offshore projects in Saudi Arabia are part of the long-term agreement (LTA) in force,” said Saipem.

“In particular, the activities for the

first project include the engineering, procurement, construction and installation (EPCI) of a crude oil trunkline measuring around 50km for the Abu Safa oil field, while those relating to the second project concern the Berri and Manifa oil field production maintenance programme,” it added.

After the end of the second quarter, in July 2024, Saipem was awarded a contract that brought back into focus the longest and deepest Mediterranean natural gas from Libya to Italy.

Saipem was chosen to ensure the supervision and the subsea intervention services of the GreenStream gas pipeline linking Libya to Italy and the longest and deepest pipeline ever laid in the Mediterranean Sea.

GreenStream BV, a joint venture comprising Italian oil and gas major Eni and the Libyan National Oil Corporation, awarded the work to Saipem.

The GreenStream system conveys natural gas from coastal facilities at Mellitah in Libya to Gela on the Italian island of Sicily.

Libya is a former LNG exporter but the Marsa el Brega LNG export plant was destroyed during the years of conflict in the North African nation.

The LNG facility was the third to start operations in 1970, after Alaska and Algeria, and exported 3.2 million tonnes per annum from four liquefaction Trains.

As part of the broader and revived Western Libyan Gas Project, GreenStream connects the Mellitah Compression Station, on the Libyan coast, with the receiving terminal in Gela, Sicily where Libyan gas arrives from two fields.

The first gas field, Bahr Essalam, is offshore Libya and the second, the Wafa gas field, is located in the Libyan desert near the border with Algeria.

**SEA-LNG**, the industry coalition, has claimed that significant progress is being made to eradicate methane slip as LNG uptake accelerates.

With continued collaborative efforts with stakeholders, methane slip will be eliminated for all engine technologies within the decade, the coalition said.

Today, 2-stroke diesel cycle engines account for around 75% of the LNG-fuelled vessel orderbook. These engines have already effectively eliminated slip. For low-pressure engine technologies, where methane slip remains an issue, manufacturers have cut slip levels from 4-stroke engines by more than 85% over the past 25 years.





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It is worth noting. Sea-LNG said, that methane slip has been eradicated for the similar LNG dual-fuel engine technologies used in the heavy-duty vehicle sector. The science is clear, the technologies exist, and engineering will soon solve the problem, the coalition claimed.

Peter Keller, SEA-LNG Chairman, said: "We congratulate the efforts and initiatives, such as the Methane Abatement in Maritime Innovation Initiative (MAMII) and the GREEN RAY project. As LNG continues to gain widespread recognition as the current practical and realistic alternative fuel pathway, it is reassuring to see growing evidence that the challenge of methane slip will be eliminated within this decade."

Clarksons' data showed that 109 LNG dual fuel vessels were ordered in 2024 up to June. There are now more than 550 LNG-fuelled vessels in operation, a number expected to double by 2027.

Keller concluded: "There is universal agreement that the science is understood, and we have the necessary tools and technology to abate methane emissions, it is the final elements of the engineering that are being worked on. This, in combination with the option to transition to net zero emissions through bio-methane and e-methane, provides ship owners and operators with the confidence that vessels ordered today are future-proofed for the next 25 – 30 years. This cannot be said for any other alternative fuel right now."

This LNG endorsement came hard on the heels of the launch of the 'Say No to LNG' global shipping campaign.

Backed by seven civil society organisations, this co-operative has launched the 'Beyond Methane Pledge', an initiative that seeks to stop LNG's expansion and other methane-based fuels, and phase out their use in all sectors worldwide.

The pledge calls upon industry leaders, including shipowners, cargo owners, ports, cities, policy makers, energy producers, suppliers/utilities, transporters, and financial institutions, to take decisive action by committing to a sustainable energy future free from the dangers of methane.

As well as the health risk, LNG is also a poor investment: LNG infrastructure will become costly stranded assets for taxpayers and investors. Every dollar invested in LNG locks the energy sector into a fossil fuel future and takes away

investments that lower the cost of true zero-emission fuels.

"LNG is not a bridge fuel; it's a bridge to climate disaster. The 'Beyond Methane Pledge' is a powerful tool for collective action. Commitments around the world to reject LNG in favour of zero-emission solutions that justly address climate, pollution, and biodiversity threats will help us reach the future we need," said Curtis Martin, Canada Shipping Campaigner, Say No to LNG Campaign.

**SEMPRA** Infrastructure, a subsidiary of California-based utility Sempra, has signed an engineering, procurement and construction contract with US firm Bechtel Energy for Phase II of the Port Arthur LNG export project in Texas.

"We are confident that our continued collaboration with this world-class construction firm on the Port Arthur site will further strengthen our ability to execute this project," declared Justin Bird, Chief Executive of Sempra Infrastructure.

"Building on the success of Port Arthur LNG Phase I, which is currently under construction, the Phase II project is expected to further enhance the supply of secure, abundant and reliable US natural gas to customers around the globe," said Bird.

With Phase One currently under construction, the development of the Phase II project will increase total liquefaction capacity of the facility from 13 MTPA up to 26 MTPA.

Sempra already operates the Cameron LNG project in Louisiana and is a major shareholder in the Costa Azul LNG venture on the Pacific Coast of Mexico.

Port Arthur Phase II is making progress with sales and at the end of June 2024 Sempra signed a supply and investment accord with the world's largest oil production company, Saudi Arabian Oil (Aramco)

Sempra has signed a non-binding Heads of Agreement (HoA) as part of a 20-year deal for Aramco to offtake 5 MTPA from Port Arthur Phase II.

The accord also contemplates Aramco taking a 25 percent participation in the project-level equity of Phase II.

Paul Marsden, President of Bechtel Energy, said the firm was pleased with the opportunity to advance the engineering partnership with Sempra.

"This partnership positions Bechtel and Sempra Infrastructure to not only deliver a transformative energy infrastructure project but also brings

additional significant economic growth and development opportunities to the local community," Marsden added.

As part of the EPC contract, Bechtel will perform the detailed engineering, procurement, construction, commissioning, start-up, performance testing and operator training activities for the project.

The scope of the agreement also includes the ability to conduct pre-final investment decision work to better assure project cost and schedule certainty.

Sempra said that Port Arthur Phase II is competitively positioned as the active marketing continues.

The project received authorization from the Federal Energy Regulatory Commission in September 2023.

Port Arthur Phase 1 consists of Trains 1 and 2 as well as two LNG storage tanks and associated facilities.

"Construction of the project continues to progress, and the expected commercial operation dates for Train 1 and Train 2 are 2027 and 2028, respectively," Sempra noted.

In December 2022, Port Arthur Phase II and the UK chemicals company INEOS entered into a non-binding agreement for an offtake capacity of 200,000 tonnes per annum.

INEOS also signed a 20-year contract with Sempra for the supply of 1.4 MTPA of LNG from the Phase I development.

INEOS noted at the time that it had also signed a contract for long-term regasification capacity from the proposed German onshore LNG terminal at Brunsbüttel on the Elbe River north of Hamburg.

**SEMPRA**, the California based utility, said in its second quarter results presentation that subsidiary, Sempra Infrastructure's construction of the Mexican Energía Costa Azul LNG Phase 1 was around 85% complete.

However, in recent months the project has experienced labour and productivity challenges.

Mechanical completion and first LNG are expected in 2025, with timing of commercial operations under the sales and purchase agreements (SPAs) targeted for spring 2026.

In addition, Port Arthur LNG Phase 1 was under construction while the proposed Phase 2 expansion project was making steady progress.

Sempra reported GAAP earnings of \$713 mill, or \$1.12 per diluted share for 2Q24, compared to \$603 mill, or \$0.95 per

diluted share for 2Q23.

On an adjusted basis, the company's 2Q24 earnings were \$567 mill, or \$0.89 per diluted share, compared to \$594 mill, or \$0.94 per diluted share in 2Q23.

"At Sempra, we are pleased with the strength of our financial performance through the first half of the year," said Jeffrey W. Martin, Sempra's Chairman and CEO. "Our company is well-positioned for continued growth across each of our business platforms, which are benefiting from ongoing electrification, economic development, and demand for safe, reliable and cleaner energy."

For the first six months of this year, Sempra's GAAP earnings were \$1.514 bill, or \$2.38 per diluted share, compared with \$1.572 bill, or \$2.49 per diluted share, in 1H23.

Adjusted earnings for 1H24 were \$1.421 bill, or \$2.24 per diluted share, compared to \$1.516 bill, or \$2.40 per diluted share, in 1H23.

Sempra also updated its full-year 2024 GAAP earnings-per-common share (EPS) guidance range to \$4.74 to \$5.04, reflecting actual results through the second quarter, affirmed its full-year 2024 adjusted EPS guidance range of \$4.60 to \$4.90 and gave its full-year 2025 EPS guidance range as \$4.90 to \$5.25.

**SHELL**, the UK energy major, has claimed that it had further strengthened its leadership position in LNG, which was revealed in the UK energy major's second quarter results.

Driving this claim was an agreement to acquire Singapore's Pavilion Energy, a partnership in the ADNOC Ruwais LNG project in Abu Dhabi, and taking a final investment decision (FID) on the Manatee backfill project in Trinidad and Tobago.

Shell also said that it had enhanced its upstream portfolio with a focus on cash flow longevity by taking FID on Atapu-2 in Brazil.

"Shell delivered another strong quarter of operational and financial results. We further strengthened our leading LNG portfolio and made good progress across our Capital Markets Day 2023 financial targets, including \$1.7 bill of structural cost reductions since 2022.

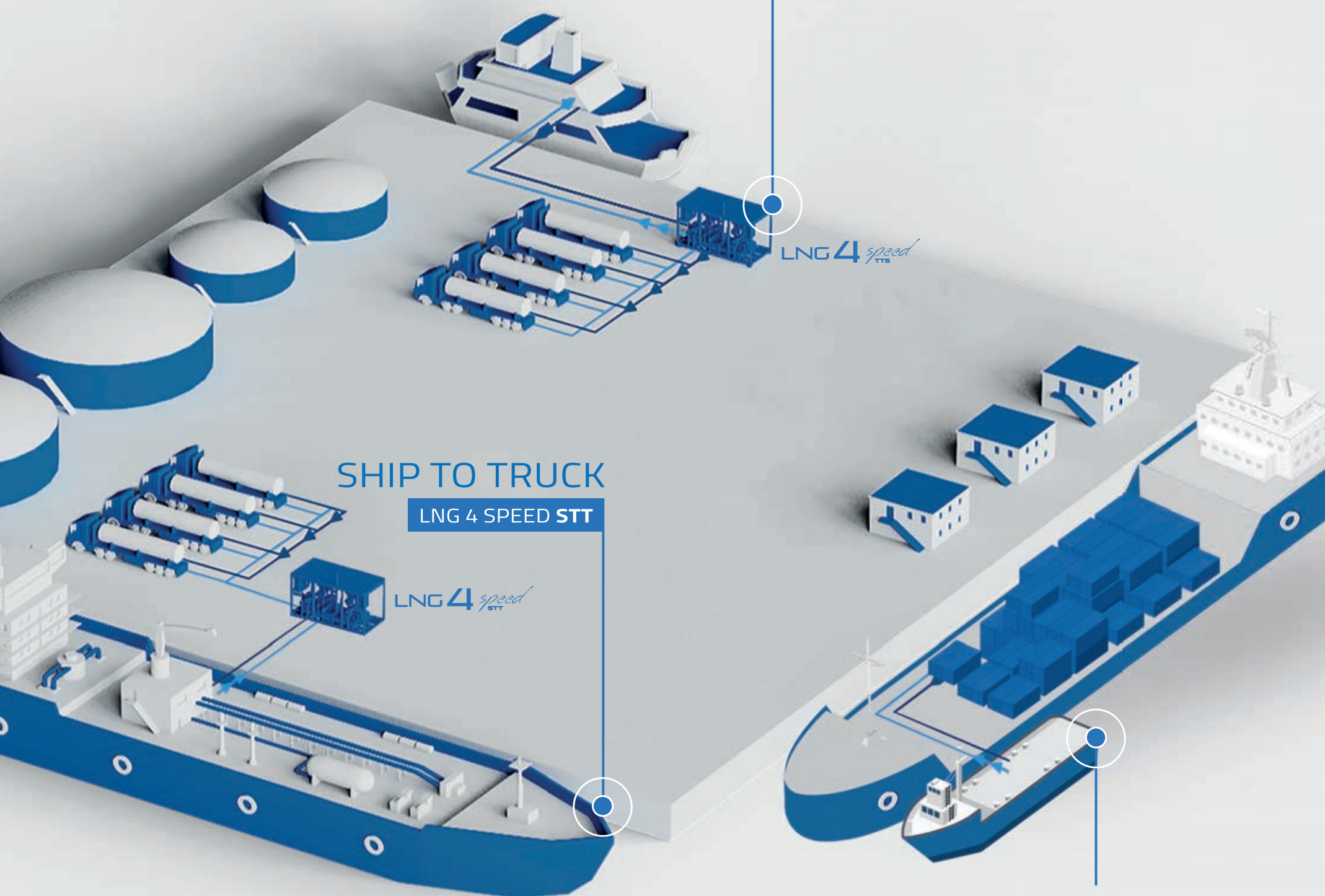
"We have also announced a further \$3.5 bill buyback programme for the next three months. We continue to demonstrate that we are delivering more value with less emissions," Shell CEO, Wael Sawan said.

Looking at its Integrated Gas division,



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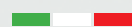


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Shell reported adjusted earnings of \$2.68 bill, out of a total of \$6.3 bill; an adjusted EBITDA of 5.04 bill, out of \$16.81 bill and a CFFO of \$4.18 bill, out of a total of \$13.51 bill.

Total LNG liquefaction volumes were 6.9 mill tonnes in 2Q24, compared to 7.6 mill tonnes in the previous quarter, while the 3Q24 outlook was between 6.8 and 7.4 mill tonnes, it said in its results presentation.

**SNAM**, the Italian gas grid and LNG terminals operator whose formal name is Societa Nazionale Metanodotti, has given a detailed update on the plans to deploy a floating storage and regasification unit (FSRU) at the port of Ravenna in the North of the Adriatic coast.

“Work is on schedule for the arrival of the FSRU, which will be based 8.5 kilometres from Punta Marina at the end of 2024 and to enter into operation in the first quarter of 2025,” said SNAM.

SNAM purchased in July 2022, for around \$400 million, the “FSRU BW Singapore” with capacity of 170,000 cubic metres.

The vessel has a potential 5 million cubic metres per annum of regasification capacity.

The FSRU is currently undergoing some adjustment work at the shipyard near Port Rashid in the United Arab Emirates.

“The regasification ship is currently on site in Dubai for the adjustments necessary for its deployment on the Italian coast in front of the Marina di Ravenna,” said SNAM.

The update was given at a news conference in Ravenna attended by Italian officials and SNAM executives, including SNAM’s Chief Executive Stefano Venier.

The event was also attended by the Italian Minister of the Environment and Energy Security Gilberto Pichetto Fratin and the Mayor of Ravenna Michele de Pascale.

“The state of progress has seen 90 percent of the required onshore work completed and over 50 percent for works offshore,” said CEO Venier.

“Work has been underway since February 2024 on the dismantling of the Petra platform, a phase which was followed, from mid-May by the installation of the structures of the new FSRU mooring platform, which is approximately 440 metres in length and weighs over 14,000 tons,” Venier added.

“Work on the breakwater of 900 metres

is currently in the tender phase and work is scheduled to begin in August 2024, guaranteeing safety and continuous operation of the terminal even in particularly adverse weather and sea conditions,” the CEO added.

The attending Italian Minister Gilberto Pichetto Fratin also noted that Italy’s regasification capacity after the “BW Singapore” starts up would increase to 28 Bcm, a volume corresponding to around 45 percent of Italian gas demand in 2023.

“This figure, 28 billion cubic metres, is equal to the natural gas that was imported from Russia in 2021 and, as such, will be help consolidate energy security on which Italy, also through the actions and projects headed by SNAM, is continuing to work on,” the Minister added.

The conference heard that over 240 suppliers have been involved in the Ravenna LNG project and more than 80 come from the local Province of Ravenna or Emilia-Romagna.

It was noted that contracts have been awarded to companies in the Ravenna area for over €300 million, which is around 30 percent of the entire project investment.

SNAM had also acquired the FSRU “Golar Tundra” in July 2022 for about \$350M from Golar LNG.

The vessel has been operational on Italy’s West Coast port of Piombino in Tuscany since July 2023.

The grid operator additionally has a controlling stake in the “FSRU Toscana”, which is currently in drydocks in the French port of Marseilles for the completion of major maintenance and repairs.

The FSRU is expected back on station in October 2024 off the West Coast Italian port of Livorno.

SNAM’s other main LNG terminal is the Panigaglia onshore facility that has operated in the Gulf of La Spezia near Genoa since 1971.

**SNAM** is making progress in acquiring more natural storage in Italy to underpin the build-out of floating LNG import terminals.

The Italian energy major has now signed a binding agreement to acquire 100 percent of the storage company Edison Stoccaggio from the Edison company for an amount of €560 million (\$607M) in total.

The agreement has been reached at the end of a long process started by

Edison back in October 2023 and continued with SNAM into 2024.

One of the hold-ups has been an ongoing administrative dispute concerning the revenues recognised in recent years for the activities of the San Potito e Cotignola gas storage site.

SNAM now expects the transaction to be finalised by the first quarter of 2025, upon obtaining the necessary authorisations under the applicable antitrust and regulations.

Edison Stoccaggio contributes to the security of Italy’s energy system through three natural gas storage facilities, located in Cellino (Teramo), Collalto (Trevise) and San Potito e Cotignola (Ravenna), with a total capacity of about 1.1 billion cubic metres per year.

Once the transaction is closed SNAM’s total gas storage capacity will be around 18 Bcm, corresponding to more than 17 percent of the entire European gas storage capacity, including the strategic reserve of 4.5 Bcm.

As a result of the acquisition of Edison Stoccaggio, the number of storage sites in operation owned by the SNAM Group will rise to 12, located mainly in central and northern Italy, close to the country’s main consumption hubs.

“Storage facilities play a key role in the security of the Italian and European gas system,” explained Stefano Venier, the SNAM Chief Executive.

“This transaction will strengthen SNAM’s industrial set-up in the sector by integrating the assets within our management model, to the benefit of the country’s system’s energy resilience,” stated Venier.

SNAM’s LNG expansion plans are now focused on deploying a floating storage and regasification unit (FSRU) at the port of Ravenna in the North of the Adriatic coast.

The is in the form of the “BW Singapore” FSRU which was purchased by SNAM in July 2022, for around \$400M. The vessel has capacity of 170,000 cubic metres.

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**TC ENERGY**, the North American natural gas pipelines operator with US and Mexican pipelines and the Coastal GasLink to supply Canadian LNG projects, is now counting the cost of the Biden Administration’s 2021 cancellation of the Keystone XL oil pipeline from Canada to the US Midwest.

The Calgary, Alberta-based TC Energy has lost its bid to recover US\$15 billion with a North American free trade lawsuit against the US government.

The 1,947km (1,210-mile) Keystone XL pipeline was designed to deliver 830,000 barrels per day of crude oil from Hardisty in the Canadian province of Alberta to the US state of Nebraska.

It would then have connected with existing facilities to reach US Gulf Coast refiners to meet critical needs for transportation fuel and manufactured products.

Keystone XL had been expected to be placed into service in 2023.

The decision also raises doubts about whether the provincial government of Alberta will recover any of its losses as an investor in the Keystone XL project.

TC Energy in 2021 recorded a C\$2.2Bln (US\$1.6Bln) after-tax asset impairment charge after the revocation of the US Presidential Permit for the Keystone XL oil pipeline project.

The company filed a legacy North American Free Trade Agreement (NAFTA) suit in July 2021 to recover economic damages resulting from the revocation of Keystone XL project permits.

A divided three-judge panel of arbitrators, sitting at the International Centre for Settlement of Investment Disputes, has ruled against TC Energy.

The tribunal said the legacy provisions tied to the former NAFTA treaty only permit claims based on breaches that allegedly occurred while NAFTA was in force.

“We are both disappointed and frustrated with the tribunal’s decision to deny our right to bring a legacy NAFTA claim,” said Patrick Keys, TC Energy’s general counsel.



TC Energy sought to recover more than US\$15Bln in damages “as a result of the US Government’s breach of its NAFTA” obligations.

The company permanently suspended the project after US President Biden revoked the permit and only about 150km of pipe was installed in Alberta.

“This ruling does not align with our expectations and views of the plain interpretation of the protections NAFTA and USMCA was designed to offer,” Keys added, referring to the United States-Mexico-Canada Agreement that replaced NAFTA in 2020.

“TC Energy was treated unfairly and inequitably in the revocation of the permit, which was driven by political considerations,” Keys stated.

The Alberta government became an investor in the project in 2021 and provided loan guarantees to TC Energy to help kick-start construction of the pipeline in the province.

The same free-trade arbitration tribunal that heard TC Energy’s case will also consider the Alberta government’s claim.

**TECHNIPFMC**, the US oil and gas and LNG project services company, reported a 24 percent increase in second-quarter revenues as profits rose along with orders and the backlog.

Revenues amounted to \$2.00 billion versus \$1.62Bln in the same three months of 2023.

Net income attributable to TechnipFMC was \$186.5 million, or \$0.42 per diluted share.

Operating profit jumped by 81 percent to \$277.7M from \$153.4M in the prior-year quarter.

Included in total company results was a foreign exchange loss of \$17.7M, or \$17.8M after-tax.

“Our quarterly results reflect strong operational performance throughout the company,” said Doug Pferdehirt, Chairman and Chief Executive.

“Results were particularly strong in Subsea, where operating profit margin improved 480 basis points sequentially to 13.8 percent,” Pferdehirt added.

Subsea inbound orders were \$2.8Bln, taking the backlog to \$12.92Bln, up from

\$12.08 billion at the end of the same quarter in 2023.

Surface Technologies reported second-quarter revenue of \$316.5M, an increase of 3 percent from the first quarter.

The sequential revenue improvement was primarily driven by increased activity in the Middle East.

Among the TechnipFMC contract list was one from ExxonMobil’s Whiptail project offshore Guyana, the small nation in the northeast corner of South America.

The company will supply subsea production systems for the Whiptail project in Guyana’s Stabroek Block.

“TechnipFMC will provide project management, engineering, and manufacturing to deliver 48 subsea trees and associated tooling, as well as 12 manifolds and associated controls and tie-in equipment,” the company explained.

Whiptail is TechnipFMC’s most recent award from ExxonMobil in Guyana, where the company has been awarded subsea production system contracts since the first contract award in 2017 for Liza Phase 1.

Another large contract was awarded for Woodside Energy’s Xena Phase 3 project in Western Australia.

Another key award was from \*A “significant” contract is between \$75 million and \$250 million.

Energear Energy’s Katlan natural gas field project offshore Israel in the East Mediterranean.

This is Energear’s first project to use TechnipFMC’s configure-to-order Subsea 2.0® production systems.

The subsea infrastructure will tie back to the Energear Power floating production, storage, and offloading vessel (FPSO), which currently serves the Karish and Karish North developments.

**TOTALENERGIES** reported a decline in second-quarter earnings led by the French energy giant’s liquefied natural gas and the refining and chemicals divisions, while exploration and production performed well.

TotalEnergies’ statement showed that adjusted net income dropped by about 6.5 percent to \$4.67 billion from \$4.95Bln



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in the same three months of 2023.

Second-quarter gross earnings slipped to \$11.073Bln from \$11.105Bln in the second quarter of 2023.

Net operating income fell by around 4.5 percent to \$5.34Bln from \$5.58Bln in the same three months of 2023.

Of the five divisions operating income rose in two of them, Exploration and Production and Integrated Power while there were declines in Integrated LNG, Refining and Chemicals and Marketing and Services.

Integrated LNG adjusted net operating income dropped by 13 percent year-over-year to \$1.15 billion from \$1.33Bln in the same quarter of 2023 as both prices and sales volumes declined.

“Moreover, gas trading did not fully benefit in markets characterized by lower volatility than during the first half of 2023,” said the company.

“TotalEnergies actively continues to increase medium-term oil exposure within its LNG portfolio by signing two new mid-term Brent-indexed LNG sales contracts in Asia for 1.3MT per year,” it added.

Two oil-linked LNG sales contracts were signed, one with Indian Oil Corp. Ltd (IOCL) for 800,000 tonnes per annum for 10 years and another for 500,000 tonnes a year for five years with Korea South East Power.

However, the earnings statement showed that overall LNG sales dropped in the first quarter by 20 percent to 8.8 million tonnes from 11.0MT in the same three months of 2023.

For the first-half LNG sales were down 12 percent to 19.5MT from 22.0MT in the same half of 2023.

“LNG sales decreased notably due to lower spot purchases, in a context of lower LNG demand in Europe,” said TotalEnergies.

The company’s average realised LNG price in the second quarter was \$9.32 per million British thermal units, down from \$9.58 per MMBtu in the first quarter and \$9.84 per MMBtu in the prior year quarter.

TotalEnergies further overhauled its portfolio through acquisitions in Malaysia and deep offshore Congo, and divestments of mature assets in Nigeria, Congo, the UK and in Brunei.

Quarterly highlights in the Integrated LNG division included the launch of the Marsa project in Oman comprising a liquefaction plant of 1 million tonnes per annum to supply bunkering fuel at the port of Sohar.

The small-scale Marsa plant will have electricity supplied by 300 megawatts of solar panels.

TotalEnergies also joined the Ruwais LNG export project in Abu Dhabi to expand output in the United Arab Emirates.

Abu Dhabi National Oil Company’s (ADNOC) will hold 60 percent of the project and TotalEnergies, Japan’s Mitsui and UK majors BP and Shell would each own 10 percent.

The Ruwais LNG project will consist of two liquefaction Trains, each with 4.8 million tonnes per annum of capacity for a combined 9.6 MPTA.

The Ubeta onshore gas development was also decided on to boost feed-gas supplies for Nigeria LNG.

TotalEnergies noted as well that it acquired the Dorado leases in the US Eagle Ford shale gas play in Texas

The Paris-based company’s Exploration and Production division reported adjusted net operating income of \$2.66Bln in the second quarter, up 14 percent from the \$2.35Bln logged in the second quarter of 2023.

Integrated Power reported an increase in adjusted net operating income to \$502M from \$450M in the 2023 quarter.

Income from refining and chemicals dropped by 36 percent to \$639M from \$1.00Bln in the prior-year quarter.

Refining throughput was up 6 percent quarter-to-quarter in the second quarter, mainly due to lower planned maintenance.

The utilization rate at the refineries was 84.5 percent in the second quarter 2024.

“Refining & Chemicals adjusted net operating income was \$639M in the second quarter, down due to lower refining margins mainly in Europe and the Middle East that were partially compensated by the increase in the refineries’ utilization rate,” said TotalEnergies.

**TRANSNET’s** subsidiary, Transnet Pipelines (TPL), has invited expressions of interest (EoI) to switch the Lilly Gas pipeline from transporting methane-rich gas (MRG) to regasified LNG.

This project aligns with the South African state-owned entity’s commitment to boost South Africa’s gas infrastructure and support growing demand for natural gas in the country, it said.

Lilly currently transports about 500 mill cu m per year of MRG from Secunda to Durban with offtake points en route.

The project would involve the building of an intake station near Empangeni to connect with the Zululand Energy terminal at Richards Bay.

Earlier this year, Transnet had said that it was in the process of selecting an operator to develop an LNG terminal at the South African deepwater port with a Vopak consortium winning preferred bidder status.

TPL’s project will also involve splitting the gas flow at Empangeni to allow for bi-directional flow towards Durban and Secunda.

In addition, Transnet is looking to appoint a contractor to debottleneck and model the pipeline for maximum future capacity to meet market demand and secure commercial agreements.

TPL also said that the Lilly pipeline has the potential to supply the KwaZulu-Natal, Mpumalanga and Gauteng gas markets once the flow is reversed from Empangeni to Secunda.

The EoI process will help TPL assess market interest and demand for the pre-feasibility study and future requests for proposal processes, it added.

Interested parties have until 30th August to submit their responses.

**TURKEY** is to finalise LNG long-term contracts to cover the 2027/2037 period, Energy Minister, Alparslan Bayraktar said in a local broadcast.

They will be aimed at securing around 5-6 bill cu m of LNG annually to meet 12-13% of Turkey’s energy needs.

“We will soon share with the public the details of these long-term LNG contracts for the 2027-2037 period. We are making every effort to finalise the last agreements,” Bayraktar told broadcaster AHAber.

Turkey consumes over 50 bill cu m of gas per year.

Russian long-term supply contracts expire in 2025, and in late April, Bayraktar announced the formation of a new portfolio of Turkish gas contracts with global suppliers, including Algeria, Qatar, Nigeria and the US.

By securing these LNG supplies, Turkey aims to stabilise its energy imports and reduce dependency on pipeline gas.

The country currently relies on a mix of pipeline gas from Russia, Azerbaijan, and Iran, along with LNG imports from worldwide suppliers.

**US DC CIRCUIT COURT** has effectively cancelled an approval of three methane gas projects in South Texas by

the US Federal Energy Regulatory Commission (FERC) in a 6th August ruling.

This is the first time that a court has vacated FERC approval of an LNG terminal, US environmental lobby Sierra Club said.

In 2023, FERC re-approved Venture Global’s Rio Grande LNG, Texas LNG, and the Rio Bravo pipeline, despite widespread concerns for the harm the projects would cause to the surrounding communities and the climate.

The Sierra Club, the City of Port Isabel, the Carrizo/Comecrudo Tribe of Texas, and Vecinos para el Bienestar de la Comunidad Costera, sued FERC for failing to adequately consider the environmental justice impacts and greenhouse gas emissions of the three projects, as required by the US National Environmental Policy Act and the Natural Gas Act.

The court upheld most of the petitioners’ arguments and vacated FERC’s approvals. As a result, FERC will now have to reconsider the impacts of all three projects, with a new draft supplemental environmental impact statement (DEIS) and a new public comment period, before deciding whether to issue new permits.

Advocates and residents of South Texas have long opposed these three projects, due to the impacts on indigenous land, public health, and the surrounding environment.

If built, Rio Grande LNG, Texas LNG, and the Rio Bravo pipeline would destroy endangered species habitats and numerous acres of wetlands that are sacred to the Carrizo/Comecrudo, and would release hazardous chemicals into the air that have been linked to asthma, cancer, and other health conditions, the Sierra Club claimed.

They would also pose explosion and leak risks that harm people and wildlife and would emit millions of tonnes per year of climate-warming greenhouse gases, thus contributing to climate change while communities in South Texas feel the real consequences of extreme heat and storms.

This decision, coupled with two other decisions in July, call into question the adequacy of FERC reviews, it added.

Last week, the DC Circuit Court ruled that FERC failed to consider increased greenhouse gas emissions and the market need for a Regional Energy Access Expansion (REAE) fracked gas pipeline project in the Northeast.



Earlier in July, the same court ruled that FERC failed to adequately assess Commonwealth LNG's air pollution impacts and greenhouse gas emissions.

Nathan Matthews, senior attorney for the Sierra Club, said: "This decision affirms what South Texas communities have long known and been fighting for: Environmental justice matters and FERC absolutely must consider these issues when deciding on such massively harmful projects.

"Today the court said that FERC must look at impacts on these communities and also ensure that they have a full and meaningful opportunity to participate in the process. FERC failed to do that with these projects. FERC also postponed analysing NextDecade's proposal to add carbon capture and sequestration, but the court said the agency cannot abdicate its responsibility to decide whether carbon capture is a good idea.

"Today marks a win for environmental justice in South Texas – and for people across the country pushing FERC to consider environmental justice impacts.

"This is the third time in a month that the DC Circuit has held that FERC failed to exercise oversight over gas infrastructure, suggesting that the days of FERC acting as a rubber stamp could soon be over," he said.

**VENTURE GLOBAL LNG**, a US LNG plant developer, is suing construction contractor Kiewit, alleging it had passed confidential documents to Shell.

Venture Global LNG's Calcasieu Pass plant has been at the centre of a long-running dispute involving energy companies, including BP, Shell and others, over access to the plant's LNG.

"Kiewit was entrusted with this information to enable its work to construct a natural gas liquefaction and export terminal in Cameron Parish, Louisiana developed by Venture Global," Venture Global said in a New York State Supreme Court filing last Friday.

The confidential information included proprietary project development, design, configuration methods, and detailed information about the multi-billion-dollar facility's design and construction, Venture Global claimed.

"Kiewit admits that it disclosed thousands of pages of confidential information to Shell and its project manager for the facility has been speaking directly with Shell about the project," the company added in the filing.

Venture Global said it will seek an arbitration award to prevent further disclosure of confidential information by Kiewit.

"We are equally disappointed by Shell who appears to have solicited this disclosure," Venture Global said in a statement to Reuters.

Kiewit is "reviewing and evaluating this legal matter," a spokesperson told the newswire. Shell did not respond to a request for comment.

Calcasieu Pass has been producing and shipping LNG for more than two years, but has not provided contract customers with supplies, claiming that the plant was not yet fully operational.

In June, the US Federal Energy Regulatory Commission (FERC) ordered Venture Global to provide customers with documentation regarding the mechanical problems and startup of its Louisiana plant.

Back in January, both BP and Shell had asked FERC to force Venture Global LNG to release documents to determine why commercial operations were stalled, calling the delay "unprecedented and inexplicable."

**WOODSIDE** Energy, the liquefied natural gas plants operator in Western Australia, reported a second-quarter increase in LNG sales revenues from the Pluto, Northwest Shelf and Wheatstone operations even at lower prices.

Woodside's report for the three months showed LNG sales increased by 1.5 percent to US\$1.617 billion compared with US\$1.595Bln in the same quarter of 2023.

However, overall sales revenues including LNG, oil, liquids and domestic pipelines gas slipped in the second quarter to US\$3.033Bln from US\$3.084Bln in the prior-year quarter.

The Perth-based company's average realised LNG prices for the second quarter came to \$9.6 per million British thermal units, down from \$10.9 per MMBtu in the same three months of 2023.

Woodside's realised crude oil prices increased in the second quarter to \$83 per barrel from \$75 per barrel in the second quarter last year.

In Western Australian LNG operations the NWS plant achieved reliability of 99.7 percent and a planned offshore maintenance was completed at Goodwyn Alpha platform.

At Pluto LNG, Woodside said reliability was 97.7 percent and a two-day turnaround was completed to enable

integration testing of the produced water handling unit into the Pluto A platform.

The company reported two separate unplanned outages during the quarter at the Chevron-operated Wheatstone plant, where Woodside is a shareholder.

These impacted the Julimar field subsea production system and the Wheatstone facility, though full LNG production was resumed in the quarter.

In a projects update, Woodside said that a cost and schedule review was performed for the Scarborough Energy Project and it remained on track for first LNG cargo targeted for 2026.

However, a revised total project cost estimate was now US\$12.5Bln and with US\$8.2Bln amounting to Woodside share.

This was a 4 percent increase from the previous cost estimate at the final investment decision of US\$12Bln. Woodside is partnering in the project with the largest Japanese LNG importer, JERA Co. Inc.

"The cost increase is significantly driven by scope maturation of the Pluto Train 1 modifications project," said Woodside.

The Scarborough and Pluto Train 2 project was 67 percent complete at the end of the quarter.

"A total of 29 Pluto Train 2 modules have been delivered to site, with 25 modules set in position at the end of the quarter and site works continuing to ramp up," said Woodside.

Marketing highlights during the second quarter included signing a long-term LNG supply agreement with CPC of Taiwan.

"CPC will be supplied with approximately 6 million tonnes of LNG on a delivered basis over 10 years, commencing in July 2024," Woodside stated.

Woodside also sold 45 percent of produced LNG at prices linked to gas hub indices in the quarter. "This represents 22 percent of Woodside's total equity production," said the company.

The Australian operator also took delivery of a new 174,000 cubic metres capacity LNG vessel on long-term charter, the "Woodside Scarlet Ibis".

Woodside added that it continued to support the Western Australian domestic market by offering additional supplies for 2025, 2026 and 2027.

The company noted that it achieved first oil from the Sangomar field offshore Senegal in June 2024, marking the delivery of Senegal's first offshore oil project.

"Sales for initial Sangomar crude cargoes loading in July 2024 received interest from European and Asian refiners. The first cargo was loaded subsequent to the quarter," added Woodside.

**YPF**, Argentina's state run oil and gas company, in a joint venture with Malaysia's energy giant Petronas, is to invest over \$30 bill in an LNG plant in the Patagonian province of Río Negro.

This ended speculation that the plant was to be built in the Bahía Blanca area in Buenos Aires province.

It was claimed that by building the facility in Sierra Grande, Río Negro, the consortium would become the fifth global LNG producer.

It was also reported that YPF's board chose Sierra Grande after a thorough technical and economic evaluation process, which found that this location offered significant advantages over the original Bahia Blanca proposal.

One advantage was that shorter pipelines are needed to ship the natural gas from Vaca Muerta, resulting in lower costs and greater efficiency. In addition, the water depth in the Sierra Grande area is greater, minimising the need for dredging to achieve an adequate draft for LNGCs.

Also taken into consideration was the availability of larger tranches of land and less interference with other social and economic activities in the area. In addition, Río Negro province offered favourable conditions for its development seeking to boost the Patagonian economy.

Both companies said that Río Negro had "better economic aspects for the project, even if Buenos Aires were to match the tax benefits," quoting a report from the international consulting firm Arthur D Little.

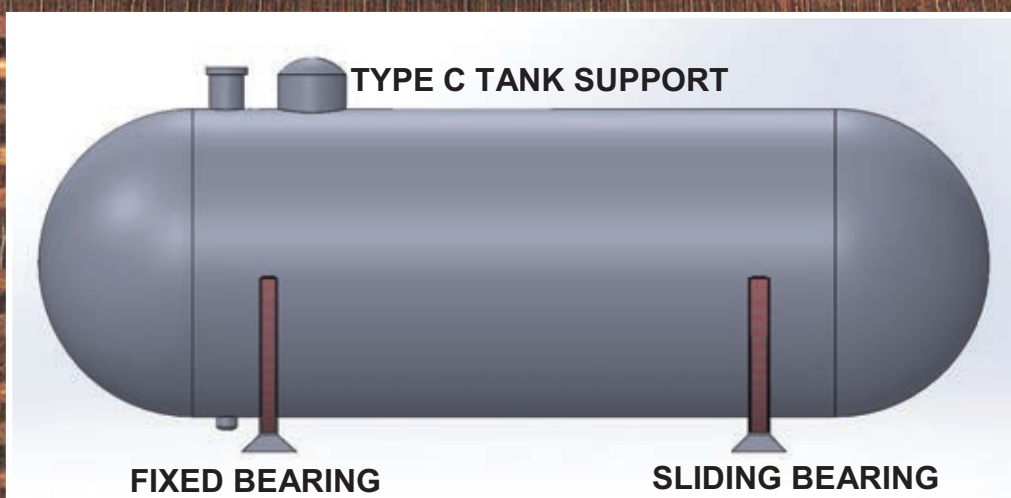
It was also explained that Río Negro can develop a deepwater port where large ships can berth, thus lowering transportation costs.

YPF and Petronas will also ask other companies in Argentina involved in natural gas production, such as PAE, Total Austral, Tecpetrol, Pampa Energía, CGC, and Wintershall Dea, among others, to join a partnership for large-scale exports.

Meetings with potential buyers have already been scheduled, it was reported.

With a joint investment worth \$1.5 bill, this consortium is part of YPF's plan to invest \$10 bill over the next 10 years. ■





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### **Contact:**

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Tel: +385 (0)98 413 366

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## 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 | Storage 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 Hangjiixin 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          |
|                    | Zhangzhou LNG           | PipeChina                           | 2024     | 3.0                  | 3             |                  |
|                    | 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 Cipton     | 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          |
|                    | Chhara LNG              | HPLNG                               | 2024     | 5.0                  | 2             | 400,000          |
| 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) | 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           |
|                   | Korea Energy Terminal    | SK Gas, KNOC                             | 2024     | 2.4                  | –     | –                |
| 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     |
|             | Barcarena FSRU       | NFE                                           | 2024     |
|             | GNL de Sao Paulo     | edge                                          | 2024     |
|             | KARMOL LNGT Sepetiba | Karpowership                                  | 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 Pacífico                          | 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     |

| Country          | Location (Project)       | Owners                    | Start up    |
|------------------|--------------------------|---------------------------|-------------|
| Hong Kong, China | FSRU Bauhinia            | CLP Power                 | 2023        |
| India            | Jaigarh (Mothballed)     | H-Energy                  | 2022        |
| Indonesia        | Lampung                  | Hoegh LNG, PGN LNG        | 2014        |
|                  | Nusantara (Jakarta Bay)  | Golar LNG, Pertamina      | 2012        |
|                  | Benoa LNG                | PT Pertagas Niaga         | 2016        |
|                  | Amurang                  | Karadeniz                 | 2020        |
|                  | Jawa Satu FSRU           | Pertamina                 | 2021        |
| 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        |
|                  | Ruwais, Abu Dhabi        | Gasco (UAE)               | 2016        |
| UAE              | Jebel Ali Port, Dubai    | DSA (UAE)                 | 2010        |





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## 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 |
| 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     |
|              | Ahlong 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 |





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## 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<br>Skikda         | Sonatrach                                                                                | 1964-2014 | 13           | 20.8                 | 6            | 920,000     |
|                       |                         | 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<br>Idku        | Eni, EGAS, EGPC                                                                          | 2004      | 1            | 5.0                  | 2            | 300,000     |
|                       |                         | 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     |
| Mexico                | Altamira Fast LNG       | New Fortress Energy                                                                      | 2024      | 1            | 1.4                  | –            | –           |
| 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             |
|                       | Obssky 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 Energyy                                                     | 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              |





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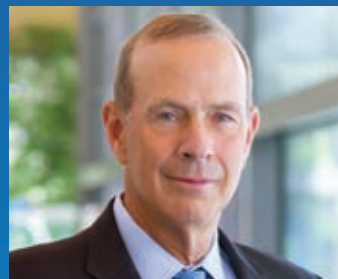
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