



CROWLEY NEWBUILD TAKES LNG BUNKERING TO NEXT LEVEL IN US

Shell will long-term charter the largest LNG bunker vessel yet in the US, after inking a deal with Crowley Maritime for a 12,000-m³ capacity newbuild. Ordered from Fincantieri Bay Shipbuilding, Sturgeon Bay, Wisconsin, the 126.8-m vessel will have “advanced technologies in cargo handling capabilities and increased transfer rates, including a state-of-the-art solution from Shell and Crowley Engineering Services to flexibly deliver LNG to various types of LNG containment systems”, said Crowley in a press statement. A Crowley spokesperson confirmed the barge will be fitted with two IMO Type C, foam-insulated tanks, with a beam of 20.7 m, depth of 11.6 m and design draught of 5.8 m. Privately held Crowley will manage the crew and bunker barge under the charter with Shell. When delivered in 2024, the LNG bunker barge will service LNG-fuelled vessels on the US east coast. Under its contract, Crowley holds options with Fincantieri to build additional barges. “Shell is dedicated to growing our LNG bunkering network across key trade routes, and this barge supports our commitment to helping provide our customers with the energy solution they are looking for,” said Shell global downstream LNG general manager Tahir Faruqi. “The shipping sector is making progress towards decarbonisation, and LNG offers immediate emissions reduction with the potential to become a net-zero emissions marine fuel given the possible roles of bioLNG and synthetic LNG.” Shell has a

long-term charter for Q-LNG's Q-LNG 4000 LNG bunker vessel, which is stationed in Port Canaveral, Florida. Q-LNG 4000 has conducted a number of LNG bunkering operations, including refuelling Carnival's first LNG-powered cruise ship, Mardi Gras. Crowley Shipping vice president Tucker Gilliam noted the strong uptake of LNG-fuelled tonnage. "Orders for ships fuelled by liquefied natural gas continue to rise, and the vessel will provide Shell an innovative and reliable service to meet demands for more sustainable energy sources," said Mr Gilliam. In 2020, about 6% of newbuild orders were for vessels using alternative fuels. This year, it has almost doubled to 12%, most of those using LNG. There are 221 LNG-fuelled vessels in operation and another 354 on order or under construction, according to DNV's Alternative Fuels Insight. Global LNG bunkering infrastructure is growing, too. There are 31 LNG bunker vessels in operation, two of which are in the US, with another 23 on order or under construction. Fincantieri Bay Shipbuilding is building Clean Canaveral, a 5,400-m³ capacity LNG bunker barge for Polar New Energy (PNE) for delivery in Q4 2021.

Besides Q-LNG 4000, Florida is also home to LNG bunker barge Clean Jacksonville, which serves Tote Maritime's two LNG-powered container ships, Isla Bella and Perla del Caribe. Both 3,100-TEU box ships operate between Jacksonville and Puerto Rico in the Jones Act trade. While this newbuild will be Crowley's first LNG bunker vessel, it is far from its first foray into LNG. It has its own fleet of LNG-powered vessels serving Puerto from Jacksonville, the conros ships El Coquí and Taíno. The 2,400-TEU vessels have a capacity to carry containers, ranging from 20-ft standard to 53-ft, and up to 300 refrigerated containers. Additionally, the conros have ventilated and weather-tight decks for a mix of nearly 400 cars and larger vehicles. By burning LNG as their primary fuel, the ships offer a 38% reduction in CO₂ emissions per container as compared with existing fossil fuels says Crowley. Built to DNV class, the conros have a Clean notation, signifying limited operational emissions and discharges, and Green Passport to identify hazardous materials on board. These vessels are fuelled at the Eagle LNG Talleyrand LNG Bunker Station located at the Port of Jacksonville, the first of its kind in North America to provide shoreside storage and bunkering equipment to deliver LNG for the conros. About 32 km from downtown Jacksonville, Eagle LNG's small-scale Maxville LNG Facility provides LNG for daily transfers by truck to Talleyrand assuring Crowley's weekly fuel supply. Additionally, Eagle LNG supplies LNG via ISO tank containers for distribution into the Caribbean for power and industrial users.

source : www.rivieramm.com

US TO CONTINUE PROVIDING NATURAL GAS TO MEXICO AND LEADING NORTH AMERICA'S LNG EXPORTS

Natural gas production in the US and Canada is expected to see 12% growth by 2025 from 2021 levels. Mexico, on the other hand, is forecasted to suffer a decline in domestic natural gas production by as much as 28% from 2021 to 2025, according to GlobalData. The leading data and analytics company notes that demand for natural gas has been growing significantly in Mexico, and the country will have to increase its reliance on imports from the US to avoid supply shortages. Steven Ho, Oil & Gas Analyst at GlobalData, comments: "Mexico has always relied on imported natural gas, but this reached a record high of 6.8bn ft³/day in June 2021 due to increased power demand, hot weather and greater industrial demand. Indeed, the country

has been preparing additional pipeline capacity for imported natural gas to ensure industrial demand is met. Luckily, supply far outweighs demand in North America, largely thanks to the US and Canada.” North America readily delivers excess gas to other regions – mainly Asian countries such as China, Japan, and South Korea, which rely heavily on LNG. Exports from the US to other regions have grown 40% in 2021 compared to 2019. Ho continues: “The US has become a bigger net natural gas exporter over the past few years, exporting up to 19bn ft³/day back in May 2021. Import volumes throughout the year have been relatively stable, averaging approximately 7.5bn ft³/d in the past five years.” The US accounts for approximately 82% of North America’s natural gas production, followed by 15% from Canada and 3% from Mexico. Ho adds: “In Canada, growth in natural gas demand is relatively muted, used mainly in upstream, power generation, residential and industrial sectors. Therefore, the majority of natural gas production growth is planned for liquefaction to increase Canada’s LNG export capacity. Canada’s planned and announced LNG liquefaction capacity will grow significantly in the coming decade, with an additional 1.8bn ft³/d planned in 2025 and as much as 9.6bn ft³/d by 2028. “In the US, it seems unlikely for the future growth rate in natural gas to return to pre-pandemic pace due to the increasing competition in power generation by renewable energy sources. Natural gas power generation accounts for up to 18% in 2021 but will shrink down to as low as 14% in 2025, while solar power will slowly take a bigger share in power generation capacity, growing from 9% up to 15% in 2025.” Source : www.naturalgasworld.com

CHARTER CONTRACT QUESTIONS EMERGE AS LNG CARRIERS FACE EEXI AND CII

Some shipowners have been consulting lawyers over how the repercussions of the new Efficiency Existing Ship Index (EEXI) and Carbon Intensity Indicator (CII) regulations might play out for the long-term charters on their vessels. Stephenson Harwood partner Tom Adams, a lawyer who has made a deep dive into the subject and is advising companies, said LNG emerges as something of a special case. This is partly because the target reductions for vessels under EEXI are relatively high, but also because it is one of the only sectors that has reduced speed mechanisms written into charterparties. For older, less efficient ships, he said the only way owners can meet the targets is most likely by reducing speed and fitting power limiters. Adams said any initial modifications are likely fall to the shipowner because it is an owner’s responsibility to comply with pollution conventions. But he asked: Is it right that it is the owner’s responsibility to bear all the commercial impact thereafter? Adams said there are legal issues about whether an order from a charterer to sail at a speed that was guaranteed, but that the vessel can no longer make because of modifications made to comply with the International Maritime Organization regulations, is an order that owners are obliged to follow. “The predicament is that owners have an apparently conflicting set of obligations,” he said. Shipowners might say a charterer’s order is impossible or unlawful, so they would be entitled not to follow it, he explained. But charterers might argue to use the contractual mechanism for reduced speed and ask to be compensated by cutting hire costs because the vessel can no longer go faster. Cases involving illegitimate orders usually centre on things charterers did not contemplate, Adams said. But in this case the charterer would have contemplated sailing at these speeds, so it is difficult for owners to say they should ignore charterers’ orders. Adams said that as a retrospective assessment of a vessel’s efficiency, CII raises a different question. An owner might receive an order from a charterer that it is obliged to perform and at the time

looks legitimate but that may ultimately prove to have been an inefficient operation. This might then result in a vessel having its CII rating downgraded. For new contracts, a standard clause could be included, Adams said. “But for charters assigned some time ago for a long time hence, it is going to be potentially a problem that the parties are going to have to grapple with.”

source : www.tradewindsnews.com

GOLAR LNG IS STICKING WITH ITS SHIPPING AS MARKET PROSPECTS BRIGHTEN

FLNG might be its first love, but new chief executive Karl Fredrik Staubo says the company is no seller of LNG shipping. Golar LNG believes the LNG shipping market is set on a positive track as demand increases and constraints to excessive newbuilding and the older fleet kick in. The shipowner’s new chief executive, Karl Fredrik Staubo, told TradeWinds that LNG shipping has been “extremely tough” for the past decade. “What we see right now is extremely interesting, with counter-seasonal patterns on top of cyclical strength, and that’s what’s changed for the first time in a long time,” he said. “The LNG market is here to stay and to increase, whether it’s a transition fuel or as a longer-term cleaner fuel. We are very confident that that is the case.” New York-listed Golar took on the bulk of its current fleet as newbuildings in 2013 and 2014. In the interim, multi-year charters have mainly been offered to newbuildings and rarely to existing vessels, Staubo said. But this year that changed. In August, Golar announced it had locked away one of its vessels on a five-year deal. Staubo said higher LNG prices and the regional differences between them are driving LNG freight rates, with price volatility adding to shipping action. New US liquefaction capacity, coupled with incremental demand growth in Asia, is in effect doubling the shipping distance over US shipments to Europe. “We are bullish about LNG as a fuel because of its environmental effects and its flexibility. We are bullish about the shipping on the back of that because of incremental capacity being added further away from the incremental demand driving ton mile distance,” he said.

Golar is also watching the LNG orderbook, which is currently about 20% of the fleet. Staubo believes yard quotes of around \$220m for a newbuilding, coupled with the expected challenges that will face the LNG steam turbine ships as they come off hire in the next 12 to 36 months, will put a lid on supply. He reiterated his view that Golar fixed too many of its ships in 2020 in the face of the global pandemic. It is now signalling that those vessels will come off hire into a hotter market where it hopes to reset their rates. “We have a portfolio approach,” he said. “We want to have part of the vessels fixed, part of them spot and on floating rates.” Golar has been vocal about its interest in spinning off its LNG shipping into a separate entity. The sell-off of its downstream assets with the sale of Hygo Energy Transition and Golar LNG Partners to New Fortress Energy this year has simplified Golar’s structure into LNG shipping and floating LNG (FLNG). But Staubo said company executives have not said they are sellers of LNG shipping. “What we said is that we are opportunistically looking at ways of separating our shipping and FLNG business as we struggle to get an efficient currency for Golar’s share price by keeping different LNG exposures in one company,” he explained. “We like LNG shipping and FLNG projects. Right now and for the next couple of years, we are very optimistic about both business segments. However, we do not necessarily think that the most efficient way for us to maintain that exposure is by keeping them both under the same roof.” He said the company is open to discuss

alternatives to separate shipping but does not need to do anything. “For those that think that's interesting, they should reach out to us, and vice versa.” Staubo would not rule out investing in LNG shipping again, but said the company's current incremental dollar goes to FLNG and upstream, where it believes it has the edge. 'Congratulations' !! “I think we are doing a good job on shipping — but, to be fair, so are others. “If I could choose to do one FLNG project or buy another five to 10 [LNG] carriers, I would very likely do the FLNG project, because we see the economics as superior.” Looking ahead, Staubo thinks that on average the LNG shipping fleet will make more money this winter than last. He believes LNG shipping is moving from an industrial business into a commodity play with more spot cargoes, growing demand and geographical disparities. “We think this is shaping up to hopefully reap the benefits for those who have been patient enough to wait it out. And for those who avoided waiting and managed to get in just now — congratulations.” source : www.tradewindnews.com

NEW 'FACTORY LNG' CONCEPT WOULD ADVANCE SMALL-SCALE LNG PENETRATION

Known as Factory LNG, the technology leverages the Australian energy producer's intellectual property and LNG experience and MAN's global manufacturing and project-execution expertise. Incorporating a nominal 0.05 mta unit, the Factory LNG unit is shipped in a 40-ft ISO shipping container, allowing transport via standard heavy-lift shipping and trucking logistics. The unit uses MAN's HOFIM high-speed, oil-free, integrated motor-compressor technology, traditionally applied in subsea compression-station applications. MAN Energy Solutions said Factory LNG offers 10 years' low-to-no touch maintenance and provides flexible layout options making it easily adaptable to site constraints. The partners believe the newly developed infrastructure has the potential to unlock liquefaction capabilities at multiple locations around the globe. The system is designed and manufactured to be scalable so customers can increase the number of Factory LNG units used as the market grows, delivering LNG at pace with demand. “Liquefied natural gas represents an essential bridging technology towards a carbon-free future,” said MAN Energy Solutions chief sales officer and executive board member Wayne Jones. “With our new solution, LNG can be broadly applied, opening up significant potential for customers worldwide. It can be used to add capacity to existing production, or to create an LNG hub for marine, land transport or other industry needs, unhindered by traditional location-constraints.” “Factory LNG's design paves the way for reduced manufacturing costs and shorter construction timeframes compared with traditional stick-built or modular LNG trains,” said MAN Energy Solutions senior vice president sales and project management upstream and midstream Basil Zweifel. Describing it as a “simple and reliable solution” for displacing diesel, Woodside vice president technology Jason Crusan noted the technology could lay the groundwork for green fuels. “Woodside sees an important role for natural gas in a lower-carbon future. We are committed to diversifying markets for LNG, including as a lower-emissions fuel for activities such as trucking and shipping. The Factory LNG system also brings potential for green fuel production by coupling it with synthetic methane units or bio-gas production,” said Mr Crusan. source : www.rivieramm.com

CROATIAN FSRU MARKS MAJOR SUPPLY MILESTONE

Between the start of its commercial operation on 1 January 2021 and 8 September 2021, Croatia's first FSRU LNG Croatia has converted some 1.6M m3, according to the state-owned terminal operator. "From the start of commercial operation on 1 January 2021 to 8 September 2021, the LNG Terminal sent more than 1Bn m3 of natural gas to the transport system of the Republic of Croatia. That translates to more than 1.6M m3 of liquefied natural gas regasified and brought to the terminal by 12 LNG carriers," LNG Croatia said in a statement. "All of the above proves the importance of the terminal for the gas market in the Republic of Croatia and this part of Europe and the impact on regional gas flows," the company said. With a storage capacity of 140,000 m3, FSRU LNG Croatia is deployed on Krk Island in the northern Adriatic Sea of Croatia to provide natural gas to the national grid, local power plants and neighboring countries as a move to transition to cleaner fuels. The ability of Croatia to import LNG also lessens the country's dependence on natural gas from Russia, providing it with greater energy security. The former Golar Viking, LNG Croatia is expected to be operated by Golar LNG as an FSRU for at least 10 years. source : www.rivieramm.com

PETRONET PLANS FLOATING REGAS TERMINAL IN EAST INDIA

India's biggest LNG importer Petronet LNG is looking to set up a floating LNG receiving and regasification terminal at Gopalpur port in the eastern Indian state of Odisha, the company said in its 2020-21 annual report. "The LNG terminal will help meet the increasing gas demand of the eastern and central part of the country," it said. Petronet has completed the pre-project studies and is in the process of preparing the detailed feasibility report for the 4mn metric tons/year floating storage and regasification unit-based terminal. The company has signed a memorandum of understanding with Gopalpur Ports and is in discussion to finalise the key technical and commercial terms of the agreements. Petronet is in the process of taking the final investment decision for the project, it added. The company is planning a pre-feasibility report for a 5mn mt/yr land-based terminal in the future. Petronet at present operates two land-based terminals, one at Dahej in west India and another at Kochi in south India. The Dahej terminal has a capacity of 17.5mn mt/yr while Kochi has a capacity of 5mn mt/yr. The company said it is in the process of adding two additional LNG storage tanks, the seventh and the eighth, at the Dahej terminal. Petronet is also evaluating the expansion of Dahej terminal capacity to 22.5mn mt/yr. source : www.naturalgasworld.com

INDIA EYES RUSSIAN ARCTIC LNG DEAL

Indian energy companies ONGC and Petronet LNG are mulling involvement in Novatek's second LNG development in Russia's far north, Arctic LNG-2, Interfax reported September 6. Following recent proposals from the majority owner Novatek, they are discussing both offtake and investment options in the follow-on project to the operational Yamal LNG project, the Russian agency said, citing an anonymous source. Offtake agreements have become more attractive this summer as the world appears to be running low on spot LNG. The tightness in the market has sent wholesale prices to record levels and made the more polluting coal more attractive for power generation in some places. India's energy minister Hardeep Singh Puri was visiting Russia with representatives from those two companies as part of the Eastern Economic Forum in the Russian Pacific port of Vladivostok September 4-6. "All [the options] are on the table," he said, when asked whether the offer was for an equity

stake or LNG off-take only. An Indian company representative who was involved in the talks said, on condition of anonymity, that Novatek was offering 9.9% of its stake out of its own 60%, but that no agreement had been reached, adding the offer of a stake was a recent development. Other investment opportunities that came up during the forum included participation in Rosneft's Vostok Oil project and petrochemical projects. Puri spoke positively about closer economic and energy ties with Russia. During the forum, Novatek CEO Leonid Mikhelson said he did not expect financial support for the project from European governments, which would take the form of export credit guarantees. French Total has a 10% stake in the project, with the other 30% divided equally between China's CNPC and CNOOC and a Japanese joint venture. Long-term contracts indexed to oil are now a lot cheaper than spot and LNG project developers need long-term contracts to enable more affordable finance, although for much of the last decade or two, buyers have demanded a shift to short-term price indexation to take advantage of the supply-demand situation. For more on Novatek's LNG plans, read an interview with CFO Mark Gyetvay here.

source : www.naturalgasworld.com

CHINA'S TOP SPEED SELLING CANADIAN LNG ASSETS

Top Speed Energy Canada, a unit of Shanghai-based Top Speed Energy, has engaged Calgary's Sayer Energy Advisors to assist it in the sale of its Canadian assets following the unexpected death of its founder earlier this year, Sayer said September 7. The assets include two small-scale liquefaction projects, the 150,000 mt/yr Skeena LNG facility proposed for Terrace, BC and the 75,000 mt/yr Totem LNG facility proposed for Prince Rupert, BC, and Top Speed's fleet of 76 ISO containers in the Vancouver area, which are used to store and deliver LNG to domestic customers in Canada and export customers in southeast Asia under a term contract with FortisBC. The two plants are scheduled to enter service in Q4 2023 (Skeena) and Q4 2024 (Totem). Until they enter service, Top Speed acquires its LNG volumes from FortisBC's Tilbury liquefaction facility near Vancouver. It's uncertain what impact the proposed sale of the assets will have on the Top Speed's ISO exports to Asia, which were expected to reach 53,000 mt/yr by this summer. Offers related to the sale of the assets will be accepted until October 7, Sayer said. source : www.naturalgasworld.com

INDIA CONFIRMS INTEREST IN VOSTOK OIL, ARCTIC LNG-2

Indian petroleum and natural gas minister Hardeep Singh Puri on September 6 said that India is looking to invest in Vostok Oil and the planned Arctic LNG-2 export projects in Russia. "A number of new potential investments were discussed: Vostok Oil, Arctic LNG-2 [and] petrochemicals," Puri, who was in Russia to attend the Eastern Economic Forum in Vladivostok, told reporters in Moscow before leaving for New Delhi. Puri uploaded a short clip of the interaction on Twitter late September 6. Russian news agency Interfax had earlier that day reported that Indian energy companies ONGC and Petronet LNG are considering involvement in Arctic LNG-2, Novatek's second LNG development in Russia's far north. An Indian company representative who was involved in the talks told the news agency, on condition of anonymity, that Novatek was offering 9.9% of its stake out of its own 60%, but that no agreement had been reached, adding the offer of a stake was a recent development. France's Total has a 10% stake in the project, with the other 30% divided equally between China's CNPC and CNOOC and a Japanese joint venture. The minister during his media interaction said that these investments will lead to further strengthening

and deepening of relations between Russia and India. Puri said that he met important industry leaders from the Russian energy sector. During his visit, the minister met with Novatek CEO Leonid Mikhelson and Rosneft CEO Igor Sechin, among others. Rosneft is developing Vostok Oil, a massive oil development in the Russian Arctic set to produce 1mn barrels/day of oil by the late 2020s. source : www.naturalgasworld.com

CHINA'S GAS IMPORTS UP 22% IN JAN-AUG

China's natural gas imports via pipeline and in the form of LNG in January–August were 79.3mn metric tons (mt), up 22.2% year/year, the country's customs department said on September 7. Asia's biggest economy imported 10.44mn mt of gas in August, up 11.5% yr/yr and 11.9% month/month. Chinese gas imports have been on an uptrend this year owing to robust domestic demand and recovery in economic activity post the COVID-19 pandemic. source : www.naturalgasworld.com

FROM THE EDITOR: THE ENERGY TRANSITION STARTS TO BITE

In its 2021 outlook, UK oil major Shell put global LNG demand in 2040 at 700mn mt, compared with 360mn mt in 2020. In a more recent projection, US engineering company Baker Hughes raised its estimate for 2030 from 500–550mn mt to 600–650mn mt, implying an even steeper demand trajectory over the next decade. These forecasts assume continued limited growth in traditional markets and are heavily dependent on growing consumption in emerging economies, particularly in Asia, where there are major constraints in terms of capital mobilisation, the financial soundness of local partners, regulatory uncertainty and infrastructure. Most notably, these new markets need significant new domestic pipeline capacity to expand the customer base beyond existing networks and provide a more widely available alternative to the high emissions coal plants which generate so much of Asia's electricity. But LNG also faces new challenges in its traditional markets. In July, both Japan and the EU unveiled radical new greenhouse gas (GHG) emissions reduction plans for 2030. These will impact LNG demand, suggesting these markets' consumption of the fuel will peak sooner than expected. While rapidly being overtaken by China, Japan in 2020 remained the world's single largest national LNG consumer, accounting for 20.9% of global LNG imports. The EU, made up of multiple markets, in which LNG plays differing roles, accounted for a further 16.7%. There is a wider overlap between traditional LNG markets and stated net-zero-by-2050 ambitions, which includes not just the EU and Japan, but also South Korea and the UK. This is particularly so if China's carbon neutrality by 2060 goal is included. South Korea alone accounted for 11.3% of LNG demand in 2020. The government is mulling three options for near total decarbonisation by 2050, one of which envisages the complete suspension of coal and LNG development in favour of green hydrogen technologies. The other two options see emissions reductions of over 95%, making it hard to see how LNG can maintain its current share of the energy mix. In total, carbon neutrality targets for 2050 or 2060 have been set in countries representing more than 70% of existing LNG demand.

Renewable limits

The EU's Fit-for-55 package represents a huge overhaul of legislation designed to put the bloc on track to reduce GHG emissions by 55% by 2030, up from the former target of 40%. The role of gas and potential for state support in areas where

the fuel can play a decarbonization role – in transport, coal-to-gas switching, blue hydrogen production – were hotly debated. Broadly, the more coal-dependent East European member states wanted to retain these options, while west European states sought to exclude gas in an effort to avoid long-term lock-in to a fossil fuel. The result is a compromise, with the overall plan remaining heavily dependent on a rapid acceleration in the construction of renewable energy capacity. Wind industry organization Wind Europe understandably welcomed the package, particularly the increased renewable energy targets, but was quick to point out that a near doubling of annual capacity additions in the sector was unlikely without an overhaul of permitting processes, which fall under the jurisdiction of national and local bodies rather than European ones. Permitting bottlenecks have already slowed onshore wind capacity additions in Germany, while France's recent onshore wind tender managed to award only 57% of the capacity on offer. Blame for the lack of interest was again laid at the door of cumbersome permitting processes. Huge calls are also being made on the offshore wind sector just as new markets in Asia and the US open up. European utilities are very active abroad and the construction of the first US offshore wind farms will depend heavily on already over-stretched European supply chains. A report from consultants IHS Markit in July suggested that the US would miss its 30 GW by 2030 offshore wind target by some margin, achieving only 21 GW, owing to supply chain constraints. Yet even 21 GW may prove optimistic, given that the country has less than 100 MW of offshore wind currently in operation. The report could also have noted that US expansion, even below target, will stress Europe's ability to deliver its own offshore wind targets.

Japan's energy transition

Meanwhile, Japan's draft Strategic Energy Plan envisages non-fossil fuel power supply sources accounting for 60% of the country's energy mix by fiscal 2030–31, up from 24% in fiscal 2019–2020. This means a huge drop in LNG demand. The fuel's share of the energy mix would fall from 37% to 20%. Renewables will account for 36–38% of power generation and nuclear 20–22%, up from 21.6% and 4.6% respectively in calendar 2020. Notably, the target for nuclear is unchanged from the country's existing targets, which were formulated in 2015, with the challenge of accelerated transition, as in Europe, falling instead on much increased renewable energy output and ambitious energy conservation targets. Japanese total primary energy supply in fiscal 2030–31 is put at 489 million kl under the draft plan, down 62 million kl from the existing plan. Recognizing the difficulty in coordinating the ramp up of renewable energy and decline of fossil fuels, restrictions on the decline of fossil fuel generation will be maintained until sufficient non-fossil fuel sources are available.

Delivery gap

The simple fact is ambitious targets are much easier to set than to meet. The pressure to shine at COP26 is stretching the gap between resources and what is actually deliverable. LNG demand in its core markets is probably safer than the latest tranche of energy transition regulation implies, particularly as coal-to-gas switching will continue to deliver GHG emissions reductions, while CCS and blue hydrogen production should ensure some longer-term baseload demand. However, even if the emissions targets are not deliverable in full, they will be in large part and that raises questions about whether currently

forecast levels of LNG demand in core markets – Europe, including the UK, Japan and South Korea – are still valid. If not, this increases the reliance on emerging markets, where the greening of international energy investment finance and the low cost of onshore wind and solar power will almost certainly have a growing impact on the investment choices governments and lenders are willing to support. source : www.naturalgasworld.com

GAZPROM COMPLETES NORD STREAM 2, SIGNS LNG EPC DEAL

Gazprom has confirmed that it has completed construction of the Nord Stream 2 gas pipeline, while also moving ahead with plans for a new LNG plant. Nord Stream reported the final pipe had been welded on September 6. The Fortuna barge had carried out the work. It then lowered this into German waters. The next step is to connect the pipe at the German shore to the section from Danish waters, the company said. It set out the expectation that the pipeline would go into operation before the end of the year. Pipelaying began in September 2018. Each of the Nord Stream pipelines is able to carry 55 billion cubic metres per year of gas, giving the combined total of 110 bcm per year. Russian President Vladimir Putin, speaking in June, said Gazprom was ready to fill the link with gas. The pipeline will “ensure energy security and reliable gas supplies for the Europeans, like Nord Stream 1. I must add that this project is profitable economically and fully conforms to the most stringent environmental and technical requirements.”

Further export plans

Gazprom has signed an engineering, procurement and construction (EPC) for a new LNG plant near Ust-Luga with Linde and Renaissance Heavy Industries. Gazprom signed the deal via Rus Khim Alyans, its joint venture with Rus Gaz Dobycha. The companies agreed the deal at the St Petersburg International Economic Forum in June of this year. Linde and Renaissance will handle design and supply of equipment, in addition to construction and installation at the facility. The plant will have two trains, with 13 million tonnes per year of total capacity. Rus Khim Alyans is working on a gas-processing complex near Ust-Luga. Gazprom has said this will be the largest in the world in terms of gas processing capacity, at 45 billion cubic metres per year of gas. It will provide 18 bcm of processed gas into Gazprom’s transmission system. It will also have ethane processing capacity and produce up to 3mn tpy of polymers. Ethane-rich gas will initially come from the Nadym-Pur-Taz region, in Yamal-Nenets. In future, it will come from Tambeyskoye, a field on the Yamal peninsula. Gazprom is adding new strings to its bow. The company announced the signing this month of a plan to produce blue hydrogen in the Sakhalin region, in Russia’s east. Rosatom agreed to consider options for building the plant, while Gazprom would supply the feedstock. source : www.energyvoice.com

NOVATEK ADDS TO MORE FIELDS TO ARCTIC GAS BASE

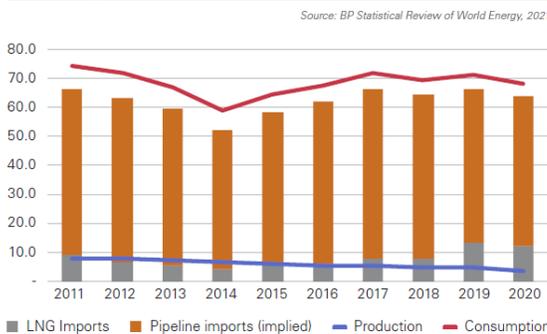
Russian LNG exporter Novatek has acquired rights to two more fields on the Yamal peninsula in the Russian Arctic, after winning state licensing auctions, the company said on September 8. The Arkticheskoye and Neitinskoye fields hold 2.9bn barrels of oil in reserves according to Russia’s classification system, Novatek said, including 413bn m3 of gas and 28mn metric

tons of liquid hydrocarbons. Novatek paid 13.15bn rubles (\$180mn) for 27-year licences for the deposits. Novatek is seeking to expand its resource base on the Yamal and neighbouring Gydan peninsulas to underpin future LNG export projects. The company's only operational liquefaction plant in the area is the 17mn mt/yr Yamal LNG, but it aims to launch a second, the 19.8mn mt/yr Arctic LNG-2, in 2023. It has plans for several more projects, estimating that it could have up to 70mn mt/yr of LNG supply online by 2030. source : www.naturalgasworld.com

ITALY WOULD PROFIT FROM NEW LNG IMPORT TERMINALS

Italian LNG imports saw a high of 13.5bn m³ in 2019 and, despite the impact of the coronavirus, which hit the country particularly hard, remained elevated in 2020 at 12.1bn m³. The drop in LNG import levels last year, 1.4bn m³, was relatively small considering that consumption fell by 3.1bn m³ and domestic production was 0.7bn m³ lower at just 3.9bn m³ (Figure 1).

FIGURE 1 Gas consumption, production and imports in Italy (bn m³)



LNG imports met 17.8% of Italian gas demand last year, down from 19.0% in 2019, but still the second highest level on record.

Arrested development

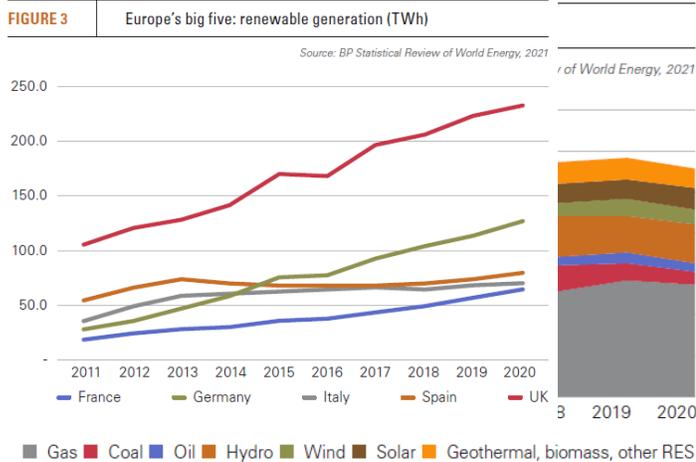
Italy was an early starter on the LNG scene, being only the fourth country in the world to build an LNG terminal, Panigaglia LNG, which came onstream in 1971 with capacity of 2.5mn mt/yr. This allowed it to import short haul LNG from Libya's Marsa El Brega LNG plant, which started up in 1970. However, it took until 2009 for the country's second import terminal, Adriatic LNG, to be completed. The terminal has capacity of 5.8mn mt/yr. Italy's third facility, Toscana FSRU, followed four years later, adding a further 2.7mn mt/yr, bringing the country total to over 11mn mt/yr (15bn m³). For the last two years, Italy's LNG import terminals have been operating at high levels, a development reflecting the introduction of an auction-based allocation mechanism in April 2018. According to International Gas Union data, utilisation last year was 82%, second only in Europe to Belgium's 90% and much higher than countries like France (66%), Spain (37%) or the UK (38%). Italian regasification capacity as a proportion of overall gas consumption is, in fact, low - 22.1%, in comparison with 33.4% for the Netherlands, 71.5% in the UK and 83.5% in France.

Individual market characteristics

Europe's gas systems nationally have very different characteristics, so Italy's limited LNG import capacity in relation to overall consumption is not necessarily a weakness. Germany, the EU's largest consumer of gas, for example, has yet to build its first LNG terminal, finding supply security in multiple import pipeline connections and large gas storage volumes. Italy, too, relies on large working gas storage capacity, second only to Germany in the EU, and diverse pipeline connectivity, which has been further enhanced by the Trans-Adriatic Pipeline (TAP), which came on stream last year. In contrast, the UK has a large amount of LNG import capacity relative to overall demand and diverse pipeline connections, but exceptionally small storage capacity. Following the closure in 2017 of the Rough facility, the UK had just 1.5bn m³ of working gas storage versus total

consumption of 79.5bn m³. Little has been added since. In comparison, Italian storage capacity at the time was 18.4bn m³ and Germany's 24bn m³. A key difference with both Germany and Italy is that UK domestic gas production remains relatively high at 39.5bn m³ in 2020, equivalent to 54.5% of total consumption. In contrast, German domestic gas production accounted for just 5.2% of consumption, while the ratio for Italy was 5.8%. Both Italy and Germany are thus much more dependent on gas imports. However, the UK and Germany's generation mixes are far more diverse than Italy's, despite a rapid coal phase-out in the former and a nuclear phase-out in the latter. Germany intends to retain coal-fired generation into the 2030s, while the UK will have some, although most likely much reduced, nuclear capacity, owing to the construction of the Hinkley Point C reactor and possibly other new reactors. In addition, both have invested substantially more than Italy in renewable energy capacity. Italy is unique in that it combines a very high dependency on gas with a very low proportion of overall gas consumption that can be met through LNG imports.

Limited diversification



Across Europe, fossil fuel generation is coming under pressure from growing renewables output. Broadly, gas-fired generation is surviving as coal-fired generation is phased out via regulatory decisions, and, economically, by much higher carbon prices, following reforms to the EU emissions trading scheme introduced in 2018. In terms of phasing out coal, Italy is no exception. A decision was taken in 2017 to end coal-fired power by 2025. Last year, coal generation fell to 16.7 TWh, down from 21.3 TWh in 2019 and a high of 54.1 TWh as recently as 2012. This is a slower decline than countries

with similar or higher former levels of coal-for-power use, for example the UK and Spain, both of which have reduced coal-fired generation to minimal levels well ahead of coal phase-out deadlines. Nonetheless, it seems likely that Italy's remaining eight coal plants, already operating at low levels (*Figure 2*), will end all generation by the phase-out deadline. However, when it comes to renewables, Italy is an exception. Compared with Europe's other G7 economies - France, Germany and the UK - Italy is a laggard (*Figure 3*). Despite an early boom, solar capacity in Italy has increased in only relatively small increments since 2013, while wind has been similarly sluggish. Comparing 2016 with 2020, Italian renewable energy generation has increased by just 7.2%, in comparison with 64.3% in France, 64.6% in the UK and 37.4% in Germany. While Rome has ambitious stated goals for renewable energy, the mechanisms to incentivise deployment are not working. Under the country's RES1 decree, an auction held in June for up to 1.48 GW of new renewable energy projects attracted bids of just 98.9 MW, of which a mere 73 MW were awarded. The RES1 system originally aimed to incentivise 8 GW of capacity by 2023/24. Developers are waiting for the RES2 regime, which will follow two further RES1 auctions, but the broader problem is not so

much the auction structure or incentives but excessive bureaucracy, which results in slow permitting and decision-making processes at all levels of government. This is also holding back offshore wind development. While northern Europe is enjoying a surge in offshore wind investment, Italy has only one near shore 30-MW wind farm under construction, its first. As a result, sharp rises in renewable energy capacities and output look unlikely over the next five years, which will keep the country's dependence on gas high as coal generation declines.

High-priced market



Fact

Italy is the third biggest gas market in Europe after Germany and the UK.

Amid unusually strong summer pricing for LNG, driven primarily by Asian demand, Italy's LNG import levels have fallen this year as suppliers stepped up pipeline imports. According to data from price reporting agency Argus, Italy received 108 LNG cargoes between October 2020 and June 2021 and sent out 30.5mn m³/d into the national gas system. This made up 15.8% of total gas imports, down from 19.9% in 2019-20 and 18.8% in 2018-19. Although not helped by a short unplanned outage at Adriatic LNG in May, the drop in LNG imports reflects a large increase in Algerian pipeline imports in particular, as well as increased volumes via TAP. But given its large pipeline import capacity, it is perhaps a surprise that Italian gas prices are generally higher than the European average. The TGP tends to set the marginal price at Italy's PSV pricing point, which typically trades at a premium to the Dutch TTF. Even with the additional capacity

offered by TAP, other pipeline routes have to be used at high capacity to avoid small but expensive import volumes via TGP setting the price. Moreover, gas volumes entering Italy via pipeline are controlled by a few big players, of which Eni is the largest, and the TGP is not ruled by European gas market rules because the line runs through Switzerland. The expiry of Gazprom's long-term contract for TAG pipeline volumes expires in 2023, and Switzerland is in the process of introducing EU gas regulations, but even so, large players' dominance of the Italian gas market looks set to endure.

LNG to the rescue?

The development of additional LNG terminals could therefore play a key role in increasing competition in the Italian market, which given Italy's heavy use of gas would benefit industrial and residential consumers alike. Three projects, totalling 24bn m³ of capacity, have authorisations from the ministry of economic development, but none are listed as under construction, although a small-scale LNG terminal on the island of Sardinia was scheduled to start operating in the first half of this year.

If new capacity could be brought onstream in 2023-24 to coincide with the expiry of Gazprom's TAG contract and the possible change in Swiss laws, expected around 2024, the Italian gas market could see considerable and long overdue change. Increased competition could encourage further capacity, allowing LNG to at least cap pipeline import prices and reduce or eliminate the price setting role played by the TGP. Source : www.naturalgasworld.com

BRAZIL IS EMERGING AS SOUTH AMERICA'S MOST DYNAMIC LNG MARKET

Brazil's role as an increasingly important LNG market has gained impetus this year, owing to regulatory changes in the gas sector and continued problems in the hydro industry, which currently accounts for about 65% of the country's electricity generation. Ongoing drought has seen water levels at the nation's hydro plants fall, forcing power companies to maximise thermal power production, in what is becoming an all-too-common occurrence as rainfall patterns become increasingly erratic. Brasilia has been forced to accept that in the short term it will have to rely on power imports from neighbouring Argentina and Uruguay, with which it has 2.25-GW and 570-MW capacity respectively in cross-border connections. However, Argentina, too, is facing low hydro generation, increasing its need for gas and LNG imports.

LNG backstop

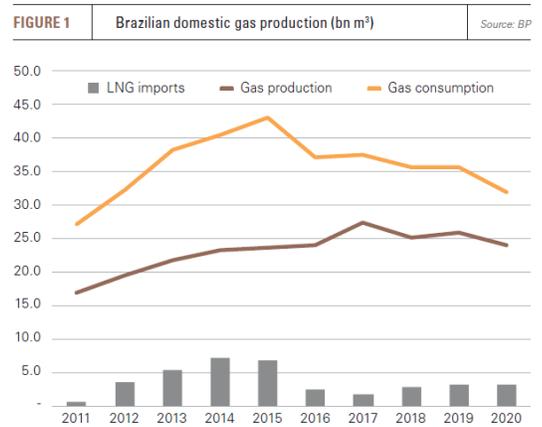
Rainfall in Brazil between September 2020 and April 2021 was the lowest on record, while reservoir levels in the regions with most hydro capacity, the Southeast and Central-West, were 29% below capacity in July. Lower hydropower production boosted LNG demand, with 17mn m³/day regasified in January-April this year, double last year's 8.4mn m³/d. An average 11,613 MW thermal generating capacity was used in April, up 37% on the same month last year, including 5,837 MW of gas-fired capacity, more than double the April 2020 figure. To address the high level of demand, sector regulator ANP in June approved an application by state oil and gas company Petrobras to double its LNG imports to 30mn m³/d this year. Longer term, the government expects thermal power generation to at least double between 2020 and 2030, as demand for electricity rises and hydro generation becomes more unreliable. LNG accounted for 23% of the gas market in Brazil in first-quarter 2021. This proportion is expected to grow, owing to a lack of growth in domestic gas production. In 2020, Brazil's gas output totalled 23.9bn m³, 7.3% lower than in 2019 (*Figure 1*).

Import capacity

Gas sector liberalisation is encouraging private sector investment in LNG import projects, but a big problem is that only 5% of municipal areas are currently supplied by natural gas, making delivery of the fuel to new customers a significant challenge.

Brazil has less than 10,000 km of gas pipelines, a very low figure for such a huge country. As a result, many planned import projects will either require truck distribution or the construction of new dedicated pipelines. LNG-to-power projects are dominating at present. Gas Natural Acu completed its 1.33-GW LNG-fed power plants in Rio de Janeiro in May, while the 1.5-GW Porto de Sergipe LNG-to-power project came online one month later. Brazil currently has five LNG import terminals, including one in Rio de Janeiro that is operated by Gas Natural Acu, and New Fortress Energy's (NFE) Sergipe terminal in Celse. The three remaining facilities at Guanabara Bay in Rio de Janeiro state, Baía de Todos os Santos in Bahia and at the port of Pecem in Ceara state are operated by Petrobras, although the Pecem terminal is not currently in use. Petrobras is in the process of increasing the capacity of its Guanabara Bay terminal from 20mn m³/d to 30mn m³/d. In July, the government asked ANP to find a way to ensure that the Pecem terminal reopens by the end of September. In a statement, the Ministry

of Mines and Energy said: “The lack of a regasification vessel in Ceara state is preventing additional dispatch from important plants in the northeast region, which would help substantially and strategically in supplying energy to the national grid.” A new regasification vessel needs to be secured, but reports in Brazil suggest that any new vessel could be deployed at the Bahia terminal, with Petrobras’ floating storage and regasification unit (FSRU) relocated from Bahia to Pecém.



New projects underway



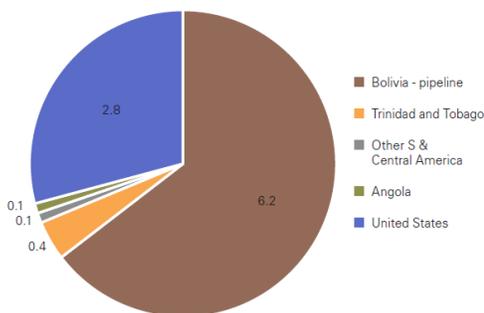
Brazil consumed **32.1bn m³** of natural gas last year, including **23.9bn m³** that it produced itself, according to BP statistics.

About ten other import projects are at an advanced stage of planning; seven have reached the licensing stage. Some of these are designed to supply single customers. Of the seven projects at the licensing stage, two separate facilities are planned for Maranhao state in the northeast, which would supply the Geramar III power plant and the Sao Marcos I and II plants respectively. NFE and Aruanã Energia, which is an offshoot of OnCorp Group, expect to bring a new import terminal at the port of Suape in the northeast online early next year. Aruana aims to use an FSRU with processing capacity of 14mn m³/d to supply the Transportadora Associada de Gas grid via a 7.6-km pipeline for local distribution. For its part, NFE plans to reach areas beyond pipeline networks by distributing LNG via trucks carrying ISO containers. NFE has also taken final investment decisions on another two projects, both with regasification capacity of 15mn m³/d: Terminal Gas Sul in Santa Catarina, which is due for completion in 2023, and the Barcarena terminal in Para, which is scheduled to come into use in 2022. In April,

NFE completed the purchase of Hygo Energy Transition from Golar LNG Partners and Stonepeak Infrastructure Fund, as it banks on rising LNG demand in Brazil, in return for \$580mn and 31mn NFE shares, giving it a total value of \$2.43bn. Wes Edens, Chairman and CEO of NFE said: “With this acquisition, we are now a leading gas and power provider in a large and fast growing market.” The deal gives it a 50% stake in the Porto de Sergipe LNG-to-power project and interests in three other FSRU terminals, plus seven FSRUs themselves and six LNG carriers.

Sector liberalisation

FIGURE 2 Brazilian LNG and gas pipeline imports in 2020 (bn m³) Source: BP



The gas market, previously dominated by Petrobras, was liberalised in March to allow much greater competition at all stages of the supply chain. The Ministry of Mines and Energy issued 30 natural gas import permits last year, by far the highest annual figure on record, while Brazilian mining giant Vale secured its first LNG import permit in July, for 1.66mn m³/d to be used for industrial heating. In addition, no new taxes have been introduced on LNG and federal taxes on FSRUs have been suspended, but new taxes have been introduced this year on

domestic gas production, processing and storage. This will increase the cost of Brazilian production in comparison with LNG, favouring imports. In addition, rather than allowing ad hoc development for specific customers or distribution over a fairly confined area, the government has begun to take a more strategic approach to LNG development. In mid-July, Brasilia's Energy Research Office (EPE), published a report which concluded that four new LNG import terminals were needed in Brazil, each with import capacity of 14mn m³/d: on the Amazon River near Manaus; at Sao Luis in Maranhao; in the town of Presidente Kennedy in Espirito Santo state; and at Pontal do Parana in Parana state. The 20mn m³/d FSRU *Presidente Kennedy* project is particularly interesting, as, in addition to LNG imports, it may also be supplied with offshore gas via the planned Route 6 gas pipeline from Brazil's giant pre-salt oil fields in the Espirito Santo basin. The terminal would supply existing and proposed local gas-fired power plant. A 20-km gas spur connection to the existing 1,387-km Gasene pipeline has also been proposed.

Suppliers

Long-term contracts for LNG supply may emerge as the domestic market for the fuel matures. Petrobras buys most of its LNG on the spot market, but higher prices this year have increased its costs. The average price of LNG imported in June was \$12.30/mn Btu, 81% higher than in March. Rising US LNG production is providing a relatively convenient source of supply, with the US providing 92% of Brazilian imports in the first half of this year, up from 82% for the whole of 2020 (*Figure 2*).

Competition for available spot cargoes comes from Argentina, which is importing similar volumes to Brazil because of its own shortage of hydro production. However, the role of Argentina in the Brazilian gas market is more complicated than that because Buenos Aires' policy of promoting domestic gas production to reduce its own LNG imports could help producers resume gas exports to both Chile and Brazil. Argentine producers that increase domestic supplies have been given permission to secure export contracts up to specified levels.

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CYGNUS ENERGY GAS & OIL

118 CONNAUGHT RD W, SAI YING PUN, HONG KONG
SANDP@CYGNUS-ENERGY.COM (SALE AND PURCHASE)
GAS@CYGNUS-ENERGY.COM (GAS PROJECTS)