

LNG Unlimited

LNG JOURNAL PUBLICATION

20 June 2023

NextDecade's Rio Grande LNG project signs 'momentous' deals

Global Infrastructure Partners and French major sign up as foundation investors
LNG News Editor

NextDecade Corp., the developer of the Rio Grande LNG export project in Texas, has teamed up with a New York investment fund and TotalEnergies to enable a final investment decision for the first three liquefaction Trains and with the French major buying 5.4 million tonnes per annum of cargoes and taking a large stake in NextDecade.

NextDecade, listed on the Nasdaq global exchange, said framework agreements had been signed with Global Infrastructure Partners (GIP) and TotalEnergies.

"NextDecade, GIP and TotalEnergies have entered into framework agreements whereby GIP would become a majority investor in Phase 1, and TotalEnergies would become a 16.67 percent stakeholder," NextDecade explained.

Houston, Texas-based NextDecade has ultimate plans and permits to produce up to 27 MTPA of LNG from five liquefaction Trains constructed in two phases at the Rio Grande facility on the Brownsville Ship Channel.

Options

"The agreements are also expected to further provide GIP and TotalEnergies options to invest in Rio Grande LNG Train 4 and Train 5 and options to invest in the planned carbon capture and sequestration (CCS) project," the company said.

NextDecade added that TotalEnergies had agreed to purchase 5.4 MTPA of cargoes from Phase One for 20 years on a free-on-board (FOB) basis indexed to Henry



NextDecade CEO Matt Schatzman sees Texas plant advance

Hub and has options to purchase LNG from Train 4 and Train 5.

Under the agreements, TotalEnergies has also agreed to acquire in three tranches a 17.5 percent common stock position in NextDecade for an aggregate purchase price of \$219.4 million.

Matt Schatzman, NextDecade Chairman and Chief Executive, said the agreements were "momentous" for the company and the project.

"We are excited to work with GIP and TotalEnergies on Rio Grande LNG and our proposed CCS project," stated Schatzman.

Share deals

The US company said the first tranche of \$40M of NextDecade common stock had already been issued and sold at \$4.9837 per share to TotalEnergies.

It added that the second tranche of \$110M will be issued and sold at the same price after FID on Phase One development.

"The third tranche will be issued and sold in an amount such that the combined stock purchases equal 17.5 percent of the outstanding common stock of NextDecade after the closing of the third tranche," said NextDecade.

"The issuance and sale of the

common stock in the third tranche will be conditional on the approval of NextDecade shareholders," explained the firm.

"Based on current estimates, NextDecade expects to sell approximately 45.1 million shares of common stock in the aggregate to TotalEnergies at an average price per share of approximately \$4.86," added NextDecade.

Patrick Pouyanné, Chairman and CEO of TotalEnergies, said the French company was delighted to join forces with NextDecade and GIP on the development of a new US LNG project, enabling TotalEnergies to leverage its extensive experience in LNG and major industrial project development.

Portfolio

"Our involvement in this project will add 5.4 million tons per year of LNG to our global portfolio, strengthening our ability to ensure Europe's security of gas supply and to provide our Asian customers with an alternative fuel to coal," added Pouyanné.

Bayo Ogunlesi, Chairman and CEO of the GIP fund, said the agreement gave the New York firm an opportunity to help shape the future of energy.

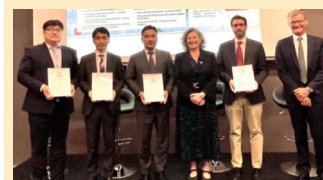
UNLIMITED AGENDA

IMPORTS

Grain LNG launches process for auction of 9 MTPA of its existing capacity

2

SHIPPING



Bureau Veritas gives approvals to initial work on LNG ship with wind assistance

3

AGREEMENTS

Jordan and Egypt sign energy accord with joint use of LNG FSRU at Aqaba

5

PROJECTS

Danish companies Makeen and Bioenergi sign agreement for biogas production plant

6

UPSTREAM

Shell moves to sell Indonesia LNG stake and offload all its assets in Pakistan

7

PRODUCTION

Air Products again selected by Qatar to provide LNG expansion equipment

9

UK Isle of Grain LNG launches consultation for auction of 9 MTPA of existing capacity

LNG News Editor

Europe's largest liquefied natural gas import terminal, the UK's Isle of Grain facility on the Medway River in Kent, has launched a consultation to auction 9 million tonnes per annum of existing capacity.

Grain LNG plans to test market demand for 375 gigawatt hours per day (9 MTPA) of capacity and the initial consultation phase for the auction runs from June 14 until July 26.

The terminal, owned by National Grid plc and operated by the National Grid Ventures unit, has used "positive feedback received from the recent 'Expression of Interest' exercise and subsequent market engagement" to offer three lots of capacity.

Shorter contracts

The company said that each lot would be entitled to 42 berthing slots, 200,000 cubic metres of storage and 125 GWh/d (3 MTPA) of regasification capacity from



UK terminal is located on Medway southeast of London

as early as January 2029.

"This is specifically designed for parties who wish to acquire a substantial stake in a major terminal in Northwest Europe, at a reduced cost and with shorter contract lengths when compared to new-build projects," Grain LNG explained.

The company noted that as the terminal's capacity already exists, parties involved would not be subjected to the final investment decision approvals or potential delays that can arise from construction issues commonly associated with newbuild terminals.

"We are really pleased with the high level of interest shown by the market at a time of significant geo-political influence on our energy markets," said Simon Culkin, Importation Terminal Manager at Grain LNG.

"It has allowed us to engage with potential customers and shape our offering to best meet their needs, whilst optimising access to this strategic asset," Culkin stated.

The company added that the consultation period would enable participants to contribute "valuable feedback" on various aspects, in-

cluding operational requirements, infrastructure enhancements and environmental considerations.

"Grain LNG values the expertise and engagement of industry stakeholders, understanding that their input is essential for optimising the existing capacity product and ensuring alignment with market needs," the company said.

The capacity auction follows a record year for Grain LNG over the 12 months from the end of June 2022 to the end of May 2023.

National Grid said the terminal sent out into the UK energy system the equivalent of 102,589 gigawatt hours (GWh) of gas during the period, the equivalent of almost 14 percent of total UK gas demand.

The Grain LNG terminal also unloaded 111 ships originating from multiple countries.

Cargoes received at the facility during the 12 months came from nations such as the US, Qatar, Angola, Algeria, Nigeria, Norway, Peru and Trinidad and Tobago.

German Transmission System Operators says update published on projects for LNG era

The German gas transmission system operators (TSOs) completed and commissioned a total of 17 projects in 2022, though five other expansion projects were dropped in the course of network modelling for the 2022-2032 Gas Network Development Plan (NDP).

The German Association of Transmission System Operators (FNB Gas) said that the Implementation Report published on June 12 contained an update on modified and delayed projects.

L-Gas and H-Gas

In order to counter the decline in domestic and foreign L-Gas production, the gas TSOs have been gradually converting L-Gas areas to H-Gas since 2015.

Given the importance of this

market area conversion for the energy industry, the Implementation Report includes an extensive update on these projects.

"Detailed planning together with local distribution system operators has not resulted in any major changes relative to the 2022-2032 NDP," said FNB Gas.

"In 2022, Gastransport Nord GmbH, Open Grid Europe GmbH and Thyssengas GmbH managed to convert a number of larger network areas, including Düsseldorf, Bonn and Mönchengladbach, with almost 500,000 units," it said.

FNB Gas added that all network expansions on the transmission system required for this purpose were completed on time.

Overall, the number of conver-

sions achieved in Germany since 2015 corresponds to an annual consumption of around 112 terawatt hours (TWh) and a capacity of 32 GWh/h.

Conversions

"The aim is to replace the Dutch L-Gas imports, which are due to expire in 2029 and to continue to guarantee security of supply," explained Inga Posch, Managing Director of FNB Gas.

Part of the German gas market is supplied with low calorific gas (L-Gas).

L-Gas comes exclusively from German and Dutch production. The remaining supplies available in Germany (gas from Denmark, low Norway/North Sea, or from LNG terminals) provide high-

calorific natural gas (H-Gas).

The two different groups must be transported in separate systems for technical and legal-for-trade reasons.

For L-Gas in the Hub tender, a cost-optimal acceptance of bids is made taking into account terms and conditions for system balancing actions.

The Germany-wide L-Gas output and volume balances are still taking into account local market conditions up to the year 2030.

FNB has also previously outlined the future role of liquefied natural gas facilities at the coastal locations of the North Sea port of Wilhelmshaven, at Brunsbüttel on the Elbe River and at the Baltic Port of Lubmin.

GTT wins concept approvals from DNV

Gaztransport and Technigaz (GTT), the French LNG storage technology company, received three approvals from European classification society DNV on its latest development projects in alternative fuels.

GTT said two of these three concepts were developed with the support of the Finnish ship designer Deltamarin.

These Approvals in Principle were presented to Philippe Berterrotière, Chairman and Chief Executive of GTT and Kristian Knaapi, Sales Manager at Deltamarin, by Remi Eriksen, DNV Group President and CEO, at DNV's headquarters during the Nor-Shipping conference and exhibition in Oslo.

The first AiP covered a concept for an LNG dual-fuel Suezmax tanker developed in collaboration with Deltamarin, fitted with a LNG fuel tank of 5,500 cubic metres equipped with GTT's Mark III system.

The second concept covers an LNG dual-fuel Very Large Crude Carrier (VLCC) also developed with the support of Deltamarin and fitted with an LNG fuel tank of 12,500 cubic metres capacity, also equipped with GTT's Mark III.

GTT said that the third AiP was for a Mark III LNG fuel tank with (ammonia) NH₃-Ready notation that includes material compatibility with NH₃, risk assessment and boil-off gas management.

"For tankers, the concepts developed by GTT aim at maximising vessel autonomy thanks to large-capacity tank, giving ship-owners and charterers the benefit of longer trade navigation with only one refuelling operation, with no impact on cargo capacity," GTT explained.

Bureau Veritas approves initial work on wind-assisted LNG ships

LNG News Editor

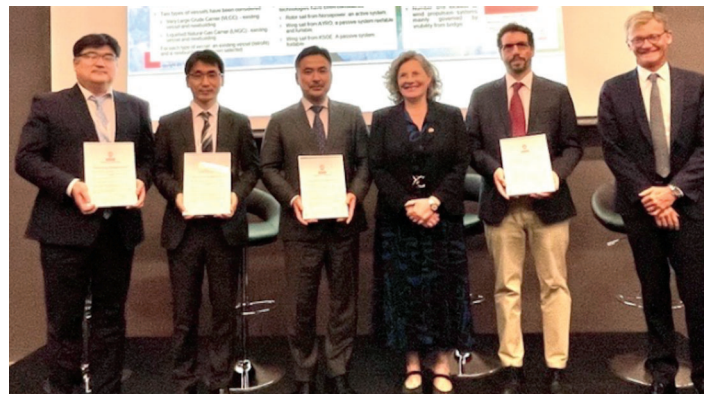
French classification society Bureau Veritas has approved a joint development project involving several companies from Japan, South Korea and France for wind-assisted ship propulsion (WASP) for an LNG carrier and a Very Large Crude Carrier.

The BV Approval in Principle (AiP) was presented to Hyundai Heavy Industries, Hyundai Global Service, Japan's main shipping company Mitsui OSK Lines and TotalEnergies Gas and Power Ltd, a subsidiary of the French oil and gas major.

The AiP was presented on the successful completion of a Joint Development Project (JDP) between all four companies to better understand and validate the potential for WASP on these ship types.

Matthieu de Tugny, President of Bureau Veritas Marine & Offshore, presented the AiP certificates to the representatives of HHI, TotalEnergies and MOL.

"The JDP focused on three



Bureau Veritas presentation to HHI, TotalEnergies and MOL

wind propulsion technologies, two of which were wing sails and one a rotor sail system," said BV.

Compatible

"The principal conclusion of the project and the subsequent issuance of the AiP demonstrate that all of these systems are compatible with existing classification rules and regulations for VLCCs and LNG carriers, thereby paving the way for more detailed work to address specific risks that would enable detailed design and arrangement work to proceed," the

French class society explained.

In March 2021, BV released an update to its rule note for Wind Propulsion Systems (WPS) Nr. 206.

"Building on pre-existing BV rules released in 1987, the rule note provides the classification requirements for modern wind-powered ships," said BV.

"BV Rule Note Nr. 206 provides load cases and coefficients for all types of wind propulsion technologies, including free standing rigs, wing sails, kite sails, suction sails and rotors," it added.

Korean Register's approval for Hyundai advance on LNG sloshing

The Korean Register (KR), the maritime classification society of the Republic of Korea with 80 offices around the world, has awarded an Approval in Principle to HD Hyundai Heavy Industries for a new type of tank shape designed for various liquefied gases and fuels.

The Korean society said that new tank shape developed by HD HHI, the nation's largest shipbuilding company and formerly called Hyundai Heavy Industries Holdings Co., is designed to improve maritime safety and productivity.

"The new tank shape aims to address the challenge of sloshing that impacts the transportation of liquefied gases such as LNG," said KR.

"Sloshing refers to the wave-like movement of liquid inside a tank

during sea transport. It is crucial to ensure structural stability by minimizing sloshing flow caused by the ship's motion, as excessive sloshing can exert significant impact forces on the tank walls, jeopardizing its structural integrity," KR explained.

Classed fleet

The society, headquartered in the South Korean port of Busan, currently classes an international fleet of 3,080 vessels.

KR said that HD HHI has successfully optimized the shape of the liquefied gas tank, effectively reducing the sloshing effect and enhancing stability.

"This significantly mitigates the risk of accidents and potential disasters during transportation. Further-

more, the innovative tank design incorporates an improved layout, leading to enhanced work efficiency and productivity," added KR.

"The newly developed tank shape exemplifies cutting-edge technology that combines improved safety measures, increased productivity and efficient sloshing reduction techniques," KR said.

HD HHI said it planned to expand the application of the new tanks to various liquefied gas carriers and other ships in the future.

It was expected that HD HHI would continue to strengthen its competitiveness in the liquefied carrier shipbuilding market, including LNG, by "providing safe and reliable solutions" to customers.

5th anniversary
Power Play
AWARDS

Presented by **ExxonMobil**



Thank you for supporting the 2023 Power Play Awards!

What started as a spark in 2019 has grown into a bright and vibrant flame as the Power Play Awards is in its fifth year of shining a light on the accomplishments of remarkable women and men who uphold the importance of supporting and empowering others in the workplace. They demonstrate how a mutually supportive environment can help support great business outcomes across all parts of the LNG value chain.

Thank you to everyone who has supported these awards over the years, especially to those who took the time to nominate candidates for the awards and to our international panel of judges who have the unenviable challenge of judging the nominations.

The finalists for this year's awards will be announced on August 8 and the winners of the Power Play Awards will be announced at a ceremony during the Gastech Exhibition and Conference in September.



LNG

ExxonMobil

NEWS BRIEFS

Japan LNG plunge

Japanese LNG imports dropped by almost 20 percent in May to 4.61 million tonnes compared with 5.76MT in May 2022. The Finance Ministry figures also showed the LNG cargo costs were down by more than 30 percent from a year ago to 412.77 billion yen (\$2.95Bln), which was 31.6 percent lower than the May 2022 LNG cargo bill of 606.23Bln yen (\$4.33Bln). Thermal coal imports also tumbled by 27.4 percent to 6.18MT. The Ministry said that Asian LNG deliveries amounted to 1.36MT, Middle East cargo volumes came to 545,000 tonnes, Russian deliveries numbered 559,000 tonnes and US shipments came to 267,000 tonnes.

TechnipFMC contract

TechnipFMC, the Houston-based subsea and energy technologies company, has been awarded a significant contract by Australian LNG plant operator Woodside Energy to engineer, procure, construct and install flexible pipes and umbilicals for the Julimar Phase 3 development offshore Western Australia.

Nigerian discovery

French major TotalEnergies has made a new oil and natural gas discovery offshore LNG producer Nigeria. "Located in shallow waters, 60 kilometres off the southeast coast of Nigeria, the Ntokon-1AX discovery well encountered 38 metres of net oil pay and 15 metres of net gas pay, while its side-track Ntokon-1G1 encountered 73 metres of net oil pay, in well-developed and excellent quality reservoirs," said TotalEnergies. "The Ntokon discovery opens a promising outlook for a new tie-back development," said Nicolas Terraz, President of Exploration and Production at TotalEnergies.

Jordan and Egypt sign energy accord to include Egyptians using LNG FSRU at Port of Aqaba amid gas surge

LNG News Editor

The Kingdom of Jordan and Egypt have signed a wide-ranging energy cooperation agreement under which the Egyptians would be able to use the LNG floating storage and regasification unit (FSRU) berthed at the port of Aqaba.

A statement said that the FSRU would be at the disposal of Egypt during the remaining period of the vessel's charter contract.

Jordan would still have flexibility to import occasional LNG cargoes while the FSRU is under contract to Jordan National Electric Power Corp. (NEPCO) until 2025.

The Jordanians started importing LNG in May 2015 when the 160,000 cubic metres capacity "Golar Eskimo" FSRU arrived at Aqaba.

The FSRU, now known as the "Energos Eskimo", is currently operated by Energos, a joint venture owner of a small fleet of vessels and held by New York-based LNG player New Fortress Energy Inc. and the US Apollo infrastructure fund.

Proposals

The vessel at Sheikh Sabah Al-Ahmad Port in Aqaba can receive 500 million standard cubic feet per day with a peaking capacity of 750 million per day.

The Jordan-Egypt agreement followed a meeting in Amman between energy executives and ministers from both countries and analysts said that it signals the start of more regional Arab cooperation in natural gas infrastructure for economic development.

A Jordanian statement said that those in attendance included Amjad Rawashdeh, the Director General of Jordan's NEPCO and Magdy Galal, the Chairman of the Egyptian Natural Gas Holding Company (EGAS).

Others present included Jordan's Minister of Energy and Mineral Resources Saleh Kharabsheh



The meeting in Amman between executives and ministers

and the Egyptian Minister of Petroleum and Mineral Resources Tarek El-Mulla. "The main objective of the agreement is to benefit from the resources of the two countries with higher efficiency at a lower cost, stressing that the use of the floating vessel in Aqaba will run until the end of its charter contract in late 2025, after which a coastal regasification facility would be completed," said the statement.

Kharabsheh said that his Ministry was now in the process of issuing tenders for the new import terminal hub and that a perspective on how far the designs meet the needs of the two countries will be in place in the next two months.

Regional pipelines

The bilateral agreement is also part of a plan for Jordan to launch a national natural gas programme to supply industry and homes in Amman and the city of Zarqa backed by Egyptian investments.

"Egypt has the expertise in domestic gas applications and will help to maximize Jordan's benefit in this field, and the Jordanian-Egyptian cooperation would be extended to implementing a number of other energy projects," added the statement.

The agreement comes amid huge development plans for the East Mediterranean, including LNG exports by Israel and Cyprus's Aphrodite field supplying feed gas to Egypt for liquefaction at an

Egyptian plant. Jordan is also an important market for Israel's surplus gas and was the anchor for development of the first phase of the Leviathan gas project offshore Israel.

More use is expected to be made in the future of the Arab Gas Pipeline (AGP), a 1,200-kilometre trans-regional gas pipeline originally built to carry natural gas from Egypt to Jordan, Syria and Lebanon.

Another regional natural gas pipeline, the East Mediterranean Gas (EMG) pipeline, supplies Egypt with Israeli gas from its East Med fields, Leviathan and Tamar.

The EMG pipeline runs from Ashkelon in Israel to El Arish in Egypt.

Gas reach

The AGP has four sections and the first section extends from El Arish to Aqaba. Its total length is 265 kilometres (164 miles), including a 15km offshore segment running under the Gulf of Aqaba.

The second section runs 390km from Aqaba to El Rehab, which is situated 30km from the Jordanian-Syrian borders. The third section is 30km in length extending from Jordan (El Rehab) to Syria (Jabber).

The fourth section constitutes part of the gas network in Syria. It runs from Jabber (Syrian side of Jordanian-Syrian borders) to the Syrian-Turkish borders, ending in Lebanon.

Danish companies Makeen and BB Bioenergi sign agreement for biogas liquefaction plant

LNG News Editor

Danish companies Makeen Energy and BB Bioenergi have signed an agreement on building a new liquefaction plant to make liquefied biogas from waste as Northeast Europe leads biogas developments that have attracted takeovers by energy majors.

Makeen and BB Bioenergi plan to construct the biogas liquefaction facility in North Denmark.

The facility will be added to BB Bioenergi's existing biogas plant to convert the biogas to liquid form and to sell as fuel.

Denmark-based engineering company Makeen Energy will cooperate with BB Bioenergi to produce liquefied biogas for trucking transportation and industry.

Biogas technology

"By integrating Makeen Energy's technology for liquefaction of biogas into their biogas plant in North Denmark, BB Bioenergi will offer an easily transportable and CO2-reducing alternative to diesel and other fossil fuels to its customers," the companies explained.

"BB Bioenergi's ambition is to



Daniel Overgaard Pedersen (left) and Frej Olsen seal deal

create the biogas plant of the future in which the liquefaction process is partly powered by energy that the plant itself generates from waste materials from the production of biogas by putting it through a pyrolysis facility on-site," they added.

Aside from the liquefaction of biogas, BB Bioenergi also aims to collect and liquefy the carbon-dioxide from the biogas plant.

They stated that the goal of the collaboration was to create a "visionary biogas plant" that can show the way forward for biogas

production in Denmark.

"We wanted a local partner and not just a supplier - someone with expertise within the field who understands our needs and can assist us in both current and future challenges in our sector," said Daniel Overgaard Pedersen, Chief Executive of BB Bioenergi.

"I am happy to have found that in Makeen Energy and I really look forward to working together," the CEO added.

Frej Olsen, Head of the Cryo division at Makeen, said that when he heard BB Bioenergi explaining

its vision he felt it was a project that made sense.

Future demand

"The fact that they chose our technology for their new plant makes us very proud, and it shows how valuable solutions of this kind are in accommodating the energy demands of the future," Olsen added.

Analysts note the energy majors have been targeting European biogas companies producing fuel from agricultural, industrial and household waste with Denmark being one of the main biogas development areas in Northwest Europe.

A Shell subsidiary in February 2023 completed the \$2 billion acquisition of Europe's largest renewable natural gas (RNG) company, Nature Energy Biogas of Denmark.

Nature Energy established its first biogas plant in Denmark in 2015 and at the time of the takeover had 14 operating plants with associated infrastructure, feedstock arrangements and production of around 6.5 million MMBtu per annum.

LNG Journal Subscription Package

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

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

Discount options are available for multi-users

Contact us for more information or to arrange a free trial

Subscription Contacts

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

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



UK firm gets offers for Egypt gas assets

SDX Energy plc, the UK-based oil and gas exploration and production company, said it had received multiple offers for its Egyptian natural gas assets and was considering them.

SDX's overall portfolio contains interests in six concessions located in various basins in Egypt and Morocco.

"We are aware of rumours concerning the Egyptian business and confirm that the company has received multiple offers in regard to the sale of its Egyptian assets, which the Board is evaluating," said SDX, a relatively small company listed on the London Stock Exchange Alternative Investment Market.

"Any proposed transaction would be subject to the usual conditions associated with a transaction of this nature, including but not limited to the satisfaction of a number of condition precedents such as government and shareholder approval," said the SDX statement to the exchange.

"The company will be providing further details in due course as well as further information on the plans to return value to its shareholders," it added.

In Egypt, SDX has a working interest in two producing assets. These include a 36.9 percent stake and operated interest in the South Disouq and Ibn Yunus gas fields and a 67.0 percent operated interest in the Ibn Yunus North gas field in the Nile Delta.

It also has a 50 percent non-operated interest in the West Gharib onshore concession in the Eastern Desert adjacent to the Gulf of Suez.

The offers to SDX come as Egyptian natural gas valuations are generally rising as more feed gas is sought for the country's two LNG export plants, Damietta and Idku, located east of Alexandria.

Shell moves to quit Indonesia LNG project and sell assets in Pakistan

LNG News Editor

Indonesian state-owned oil and gas company Pertamina is preparing to acquire Shell's stake in the Masela natural gas block that will underpin the Abadi LNG export project in Indonesia and boost future cargo availability in the Pacific Basin, while Shell is also selling all its assets in Pakistan in a pull-out from Asia's more difficult areas to do business.

The Government in Jakarta said that an agreement on the acquisition of the Masela block stake by a Pertamina-led consortium could be completed by the end of June.

Agreement

Energy and Mineral Resources Minister Arifin Tasrif said that the sales and purchase agreement for Shell's 35 percent participating interest in the Masela block was currently being finalized with Shell Upstream Overseas Ltd.

"We will have finalized the agreement by the end of this month," said the Minister.

Japanese energy company Inpex, the operator of the Ichthys LNG ex-



Location of the Abadi gas field and a Masela block drilling rig

port plant near Darwin in Australia, will remain the majority shareholder and operator of Abadi LNG with a 65 percent holding in the Masela block located in Indonesia's Arafura Sea.

Inpex has finalised the development plan for the onshore liquefaction plant to be constructed on one of the Tanimbar Islands of Indonesia to further boost Asian LNG availability as inter-basin competition grows in the years ahead.

Inpex submitted a revised Plan of Development in 2023 for the Abadi project incorporating a carbon capture and storage component and progress was expected for the liquefaction facility to be



constructed on Yamdena Island.

The project is Inpex's second self-operated, large-scale natural gas development project following the Ichthys project in Australia's Northern Territory.

The Abadi joint venture's annual production volume is expected to be around 9.5 million tonnes per annum and an expansion could be possible.

Shell Pakistan

Shell's impending exit from the Indonesian LNG project coincides with the UK-based major's total withdrawal from Pakistan.

Novatek advances with Arctic II start schedule and process patent

Novatek, the Russian operator of the Yamal LNG export plant in Northern Siberia and the developer of the Arctic LNG II venture scheduled to start up in late 2023, is continuing to function despite sanctions over Ukraine and has just accepted a Russian patent for LNG processing in Arctic plants.

"Novatek has obtained a Russian patent for its proprietary technology called 'Arctic Mix' for large-scale natural gas liquefaction using mixed refrigerants," said the company.

Critical processes

"This LNG process has been developed to implement the company's large-scale projects on gravity-

based structures with a production capacity of 6+ million tonnes per annum per LNG Train," said Novatek in a statement.

Novatek said that mixed refrigerants in the process allowed it to be used in a "wider geography" with a better energy efficiency and leaner equipment list.

"This innovation is an important step towards the localization of liquefaction process Trains in alignment with the company's strategic objective to develop LNG technologies in Russia," said Novatek.

"Leveraging domestically manufactured equipment for critical parts of the process will enhance the competitiveness of large-scale LNG projects implemented by No-

vatek," it declared. 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 European Union.

However, both companies continue to supply LNG, Gazprom from its Far East Sakhalin plant and Novatek from Yamal LNG amid a so far failed campaign by the European Commission to have Yamal deliveries to the EU halted.

While Gazprom has suffered more financially and was unable to pay a dividend since the second half of 2022, Novatek has continued dividend payments to shareholders.



LNG2023

VANCOUVER



10-13 JULY

PRINCIPAL BY



HOSTED BY



PRINCIPAL SPONSOR



INCOMING HOST



REGISTER NOW

LNG2023.ORG



Discover | Connect | Do Business

LNG2023 is a global Conference and Exhibition that brings together over 15,000 industry professionals to discuss current developments and challenges under the theme 'Fuelling a Secure Energy Future'. Discover the latest insights, connect and do business with the industry to help shape the future of LNG.

VIEW THE PROGRAMME AND REGISTER AT LNG2023.ORG

Air Products selected by Qatar to provide two more LNG mega-Trains for North Field South

LNG News Editor

Air Products, the world-leading liquefied natural gas technology company, has been selected to provide liquefaction equipment and processing for the QatarEnergy LNG expansion at the North Field South (NFS) project in Ras Laffan.

Air Products, based in Pennsylvania, said the contract includes supplying two new LNG processing Trains, adding to the four Trains currently being fabricated for Qatar's North Field East (NFE) expansion, each with a production capacity of eight million tonnes per annum.

The company said that these mega-LNG Trains leverage the AP-X liquefaction technology, enabling significantly higher LNG production.

"Once again, we are very pleased to have our LNG technology selected for the newest liquefaction expansion project in Qatar's North Field," said Samir J. Serhan, the Chief Operating Officer at Air Products.



Liquefaction equipment leaving Air Products in Florida

"Air Products' proven AP-X process technology enables significantly higher LNG production while having flexible operation over a wide range of production capacities," Serhan explained.

Performance

"The unrivaled performance, reliability, and efficiency of our equipment, coupled with responsive technical service and support, enable customers to optimize a facility's overall performance with safe and sustainable solutions," Serhan stated.

Air Products noted that it had supplied key equipment and technology for all of Qatar's existing LNG Trains operating in Ras Laffan, including the initial units, which started production in 1996 using the Air Products AP-C3MRTM LNG processing technology.

The company then supplied the six AP-X LNG process Trains, which started up between 2009 and 2011, the four AP-X LNG Trains currently in fabrication for the first NFE expansion and the two new AP-X LNG process Trains for NFS.

Qatar's NFE and NFS joint ven-

tures are in partnerships with international energy majors and will take Qatar's output from 77 MTPA to 126 MTPA.

Air Products will supply Qatar with its proprietary AP-X natural gas liquefaction process technology and equipment and associated technical services.

The equipment includes main cryogenic heat exchangers (MCHEs), subcooling heat exchangers (SCHEs), Rotoflow® turbomachinery compressors and nitrogen economizer cold boxes.

Engineering

"All engineering and design will be done in Air Products' global corporate headquarters office in Allentown, Pennsylvania, and the MCHC and SCHE manufacture will be executed at Air Products' LNG equipment manufacturing facility located on the west coast of Florida, less than a mile from the deep-water port at Port Manatee," the US company explained.

LNG equipment-maker Chart and Kathairos of Canada expand partnership for methane emissions

Chart Industries Inc., a leading global engineering design and manufacturer of highly engineered equipment with LNG and industrial gas applications, is furthering its partnership with Canadian cleantech company Kathairos.

Chart said that the Kathairos contract already included Chart's MicroBulk tanks and would now include products such as Chart's Orca™ Delivery Systems.

Kathairos has also agreed to extend its contract with Chart for a minimum of two more years.

Kathairos, whose Greek name in English means to "cleanse", offers services such as liquid nitrogen-powered field technologies and a world-class carbon accounting and reporting tool.

The Calgary, Alberta-based

company is working on methane emissions reductions from more than 400,000 remote well sites across Canada and the US.

Positive feedback

"This increase in the scope of our partnership was initiated due to the positive feedback from the market about our combined solution being effective and easy to operate and the resulting rapid adoption and scale rollout of industry-leading companies," explained Chart.

"To date, our combined solution has helped to mitigate 21.69 million standard cubic feet (SCF) of methane emissions and eliminated 20,132.55 metric tons of CO2 equivalent emissions from our customers' operations," added

Atlanta, Georgia-based Chart.

Dick Brown, Kathairos President and Chief Executive, welcomed the extension of its work with the US company.

"With our customers' aggressive plans to eliminate methane venting from their wellsite operations, this agreement with Chart ensures Kathairos will have the capacity to meet oil and gas industry targets for methane reduction by deploying tens of thousands of our proprietary nitrogen systems throughout North America over the next few years," Brown stated.

Jill Evanko, CEO of Chart, said the contracts were welcome with more demand anticipated from customers.

"We wanted our companies closely aligned to meet and ex-

ceed the market's needs as they look to decarbonize the oil and gas sector," stated Evanko.

"Together, we will continue to collaborate to help our customers meet their ambitious methane elimination targets," Evanko added.

LNG orders

Chart continues to booked LNG orders including a recent one from Bechtel for air-cooled heat exchangers, brazed aluminum heat exchangers and ethylene storage tanks for Semptra Infrastructure's Port Arthur LNG project in Texas.

The company also listed an order for liquefaction systems from the Chinese shipyard Wison Heavy Industry Co. for small-scale LNG projects.



NEXUS OF CLEAN™

"Chart's vision is to be the global leader in the design, engineering and manufacturing of cryogenic process technologies and equipment for the Nexus of Clean™ — **clean power, clean water, clean food and clean industrials**, regardless of molecule."

A handwritten signature in black ink, likely belonging to Jill Evanko.

JILL EVANKO / CEO / CHART INDUSTRIES

CLEAN CLEAN CLEAN CLEAN

 CHART DELIVERS CLEAN SOLUTIONS FOR



Power



Water



Food



Industrials



Learn more at chartindustries.com