LNG Unlimited

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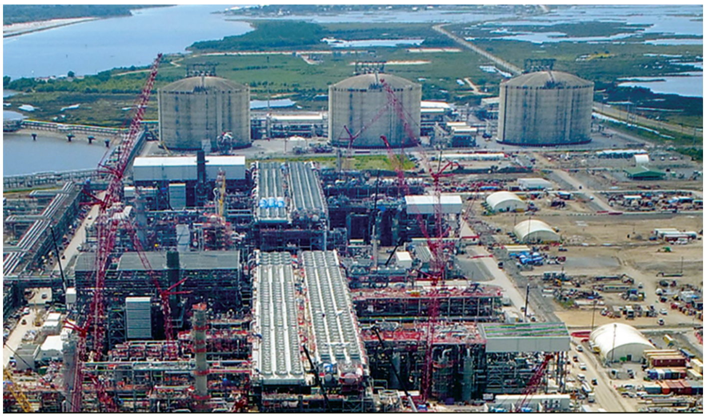
# French major Total anticipates Cameron LNG and new projects

**Liquefaction benefits increased with fresh volumes coming from Australia and Russia**

LNG Journal editor



Cameron LNG in Louisiana is close to boosting Total volumes

French energy major Total said fourth-quarter net income rose by 10 percent to $3.16 billion and jumped by 28 percent for the full year to $13.55Bln as its liquefied natural gas activities increased with fresh volumes coming from Ichthys LNG in Australia and the Yamal plant in Russia.

Total stated that its volumes would increase again in 2019 with shipments from its stake in the US Cameron export plant in Louisiana that is currently entering the commissioning process under operator Sempra Energy.

## Arctic venture

The company added that it also planned to be part of the Arctic LNG II joint venture being developed in Russia with Yamal LNG partner Novatek.

"The Group is continuing to expand along the value chain of integrated gas. With its acquisition of Engie's LNG assets, Total is the second largest publicly-traded player in the LNG business, and its position will be strengthened with the 2019 start-up of the Cameron LNG project," said Chairman and Chief Executive Patrick Pouyanne.

Total's LNG activities are included in its Gas, Renewables and Power division and it posted earnings in this segment of $756 million in 2018 versus $485M in 2017, due to a good performance from LNG and gas-power trading activities.

However, quarterly earnings in this division took a hit and were down 24 percent to $176M compared with $232M in the year-ago quarter. "The acquisitions of Direct Energie and the LNG business of Engie account for an increase in investments to $3.5Bln in 2018. The increase in working capital related to the consolidation of the acquisitions of Direct Energie and the LNG business of Engie was mainly responsible for the negative cash flow from operations," Total explained.

Total's LNG sales are for volumes and exclude trading activities. The first-quarter LNG sales rose by 24 percent to 3.32 million tonnes versus 2.67MT in the same three months of 2017. Annual LNG volume sales were little changed year-on-year at 11.07MT.

After the earnings, Total announced its latest discovery offshore South Africa.

Total has a 45 percent working interest and is the operator of Block 11B-12B, where the new Brulpadda oil and condensate well is located.

The French company's South African licence covers an area of 19,000 square kilometres and other discoveries could be expected.

"It is gas condensate and light oil, mainly gas," said Total Chief Executive Patrick Pouyanne

"There are four other prospects on the licence that we have to drill. It could be around 1 billion barrels of total resources of gas and condensate," stated Pouyanne.

In its 2019 outlook, Total said the group was in a volatile environment and was pursuing its strategy for integrated growth along the oil, gas and low-carbon electricity chains.

"The Group is maintaining financial discipline to reduce its breakeven to remain profitable across a broader range of environments," said Total.

"In particular, it is targeting cost reductions of $4.7 billion, projected net investments of $15-$16 billion in 2019 and an operating expenses target of $5.5 per barrel of oil equivalent," it added.

In Exploration and Production, output was expected to grow by more than 9 percent in 2019 with ramp-ups at projects including Kaombo North in Angola, Egina in Nigeria and at the Ichthys LNG plant in Australia.

"Determined to take advantage of the favourable cost environment, the group plans to launch projects in 2019, notably including Mero 2 in Brazil, Tilenga and Kingfisher in Uganda and Arctic LNG II in Russia," stated Total. ■

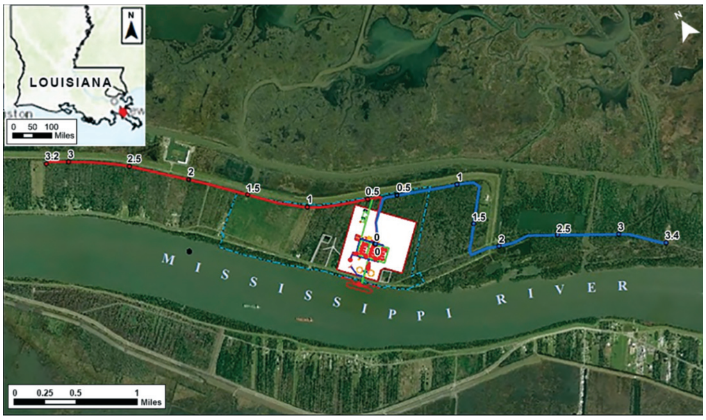
## UNLIMITED AGENDA

# FERC moves forward on Pointe LNG export project as second venture on banks of Mississippi River

LNG Journal editor

US regulators are moving forward with the Pointe LNG project proposed for the East Bank of the Mississippi River, which would be the second riverbank export facility planned for south of New Orleans.

The Federal Energy Regulatory Commission said it was preparing an environmental impact statement (EIS) that would discuss the effects of the Pointe LNG plant and associated pipelines to be sited near river mile 46 of the Mississippi in Plaquemines Parish, Louisiana.




Site is near river mile 46 in Plaquemines Parish

## Request

Pointe LNG had asked the FERC for permits in September 2018 for a site comprising about 600 acres of leased property with more than 6,500 feet of river frontage.

The project has a proposed in-service date of the second quarter of 2025 and would consist of three LNG liquefaction Trains, each with a nameplate capacity of 2 million tonnes per annum, and with connections to major regional pipelines.

The project calls for the construction of two 36-inch-diameter gas supply laterals to interconnect with the nearby existing pipeline infrastructure.

One pipeline is proposed to be built to enter the facility from the north, connecting with High Point Gas Transmission's system.

The second pipeline would enter the facility from the south and connect with the Tennessee Gas Pipeline system.

The people behind the Pointe venture are two US Gulf Coast energy veterans, former Duke Energy executive Jim Lindsay and former tanker captain Tom Burgess.

The project site includes a 250-acre area where Parallax Energy, a company started by former BG Group executive Martin Houston, had proposed in 2015 to build a riverbank project.

As founding partners in an original Mississippi River LNG venture, Lindsay and Burgess had sold the project to Houston and his then partner Cheniere Energy, whose Chief Executive at the time had been Charif Souki.

A second export project is currently planned by another company, Venture Global, for the same area of Louisiana but on the opposite bank of the Mississippi.

Venture Global is proposing that its Plaquemines LNG plant is constructed on 630 acres near river mile-marker 55 on the West Side of the Mississippi, 30 miles south of New Orleans.

The FERC said it issued a notice on February 5 to open up the scoping process for Pointe LNG when Commission staff will gather input from the public and interested state and federal agencies. ■

# Antwerp-Rotterdam-Amsterdam port region builds LNG bunkering capacity with latest pontoon offers

Fluxys, the Belgian natural gas network operator and owner of the Zeebrugge LNG terminal, has joined forces with Dutch company Titan LNG for a bunkering pontoon project to make LNG maritime fuel more widely available in the Antwerp port area and region.

The Belgian company said the bunkering pontoon would be commissioned by mid-2020 and support the shipping industry in its switch to cleaner fuel after the International Maritime Organization's sulfur cap comes into force and to also help vessels meet regulations in the Emission Control Areas of northwest Europe.

The Antwerp-Rotterdam-Amsterdam (ARA) port region is assuming leadership in European LNG bunkering with other services already available from bunkering vessels and quay-side stations in Belgium and the Netherlands.

In the latest Fluxys-Titan project Amsterdam-based Titan would be the long-term operator of the Antwerp bunkering pontoon.

The Port of Rotterdam is also building up its LNG capability with vessels such as Royal Dutch Shell's "Cardissa", delivered in 2017 and which can hold around 6,500 cubic metres of LNG fuel.

The vessel's seagoing capability enables Shell to serve customers with LNG fuel in locations around the ARA region and throughout Europe.

The Antwerp LNG bunkering pontoon will have Quay 526-528 in the port as its permanent home.

Fluxys has a concession at Quay 526-528 to provide LNG bunkering services and currently accommodates truck-to-ship bunkering on the site. "Our investment in the Antwerp LNG bunkering pontoon marks our commitment to offer concrete solutions to bring the energy transition forward and improve air quality," said Fluxys Chief Executive Pascal de Buck.

"The pontoon is yet another link we are adding to the logistics chain in Belgium to make LNG more widely available as alternative fuel for ships," he added.

The Fluxys-Titan project is the second bunkering pontoon planned for the Belgian-Dutch ports. The first will come into service at the Dutch port of Amsterdam by June 2019.

The Amsterdam bunkering pontoon will be called "FlexFueler 001" and the Antwerp facility will be named "FlexFueler 002".

The Antwerp pontoon will supply fuel to vessels such as small coasters using Antwerp port and the inland waterways.

Fluxys said the Port of Antwerp was actively supporting this development to improve local air quality and has commissioned an LNG bunkering map showing where ship-to-ship fueling is available in the harbour area.

Niels den Nijs, CEO of Titan, said the use of LNG as a marine fuel was growing fast.

"We are convinced that the Titan LNG FlexFuelers are the missing link to safe, economical and speedy LNG delivery in the ARA region," said Den Nijs.

"We feel strengthened by our Fluxys partnership and have identified ample opportunities to expand the cooperation in other geographies," he added. ■

# Nova Scotia LNG project in First Nation benefits deal

Pieridae Energy, the Canadian exploration and production company and developer of the Goldboro LNG export project in Nova Scotia with German-backed funding and sales accords, has signed a benefits agreement with First Nation people in the Atlantic coast province.

Pieridae said the agreement was negotiated with the Assembly of Nova Scotia Mi'kmaq Chiefs and has now been ratified.

Energy projects such as pipelines and industrial or energy plants are obliged under Canadian laws to recognise the land rights of Aboriginals in Canada who have spent decades establishing treaty commitments and seeking implementation of their rights.

"This benefits agreement establishes the framework under which the Mi'kmaq of Nova Scotia will benefit economically from the development, construction and operation of the Goldboro LNG Project," said Pieridae.

The Calgary-based company, headed by Chief Executive Alfred Sorensen, is on the venture list of the Toronto Stock Exchange for small commodities companies.

Pieridae said a memorandum of understanding signed in 2013 originally outlined the relationship between Pieridae and the Mi'kmaq in Nova Scotia and the deal "underscores Pieridae's commitment to ongoing engagement and relationship building" with the First Nations communities in Nova Scotia.

The Goldboro LNG project has been given the final go-ahead by the Nova Scotia Utility and Review Board after previously receiving its environmental approvals.

The final investment decision for the LNG venture is now expected by June 2019.

# Intercontinental Exchange European natural gas trade is up with Asia LNG

**LNG Journal editor**

Intercontinental Exchange, the operator of global platforms and clearing houses for energy and commodities, reported record trading in the continental European natural gas Dutch Title Transfer Facility (TTF) contract and in the Japan-Korea Marker contract used for North Asian LNG cargo pricing.

ICE said in a statement that Dutch TTF futures hit an open interest (OI) record of 1.04 million lots in January 2019.


**Japan-Korea Marker for LNG futures traded record 25,605 lots during January as activity increased**

## Dutch futures

"TTF futures and options combined achieved monthly volume of 952.4 terawatt hours (TWh) in January," said ICE.

The Dutch TTF is a virtual trading point for natural gas in the Netherlands, set up by natural gas network company Gasunie in 2003.

Since then the Dutch TTF has become a leading continental European benchmark and trading hub for spot, forward and futures gas trades. It has grown in importance as the UK prepares to leave the European Union.

"Average daily volume (ADV) and OI in TTF futures and options combined are up 103 percent and 64 percent respectively in January 2019, versus January 2018," said the trading platform operator.

ICE said the JKM LNG futures, part of price discovery by Platts, a subsidiary of US company S&P Global Inc., formerly McGraw Hill Financial, traded a record 25,605 lots in January, an increase of 22 percent compared with the previous record of 20,916 lots set in November 2018.

The JKM LNG hit an OI record on February 4, 2019, of 26,928 lots. Average daily volume and OI in JKM LNG are up 176 percent and 123 percent, respectively, in January 2019, versus January 2018.

ICE added that as previously announced it will launch its JKM LNG Average Price Options on March 4, 2019, subject to the satisfactory conclusion of applicable regulatory processes.

"Europe's vast energy infrastructure and geographical location allow it to provide a unique role as a balancing market for LNG," explained ICE.

# Shanghai Exchange records deals record for natural gas and LNG

The Shanghai Petroleum and Natural Gas Exchange said natural gas transactions reached a record high last year as demand jumped because of gas replacing coal in the general energy mix and as the northern cities adopted policies to reduce pollution.

The volume of natural gas traded on the Shanghai platform amounted to 60.46 billion cubic metres in 2018.

The Shanghai Exchange said the total deals involving natural gas transported by pipelines came to 55.54 Bcm while the volume of LNG contracts amounted to 3.33 million tonnes for the whole year.

China's pipeline natural gas imports from Central Asia and Myanmar have increased, though not at the same pace as soaring LNG import which in 2018 jumped by 38 percent and amounted to 53.81MT compared with just over 39MT in 2017, second only to Japan and its 82.85MT total for 2018.

According to data from the General Administration of Customs, China imported 90.39MT of natural gas in 2018 by both pipeline and as LNG, which was 31.9 percent higher than a year ago.

The Shanghai Exchange was inaugurated in November 2016 after a year-long trial operation as part of natural gas and energy reforms in China.

China National Offshore Oil Corp. sold imported LNG for the first time on the exchange in April 2018 for forward delivery.

CNOOC put 90,000 tonnes of LNG on sale and 11 companies made 21 successful initial bids for volumes of between 500-12,000 tonnes, paying around $10.40 per million British thermal units for delivery in July.

The aim of the exchange was to make non-residential natural gas trading an open market with daily pricing based on real trades.

By the end of 2018, it had 2,242 members, up 40 percent from a year ago.

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# NEWS NUDGES

### Argentina gets FLNG hull

Exmar, the Belgian shipping line and project company, said its floating liquefaction unit, to be renamed “Tango FLNG”, has berthed at Bahia Blanca port in Argentina where it will undertake production of LNG from onshore feed-gas delivered by pipeline for Argentine energy company YPF after being chartered for 10 years. “After the contract signing in November 2018, the unit was transported from China to Argentina onboard a heavy lift vessel,” said Exmar. “The next major project milestone will involve outfitting and commissioning the unit,” it added.

### Anadarko back in profit

Anadarko Petroleum, one of the developers of LNG production in Mozambique, posted a full-year net profit attributable to shareholders of $615 million compared with a loss of $456M in the previous year. Oil and natural gas exploration and development costs for the year amounted to $4.5 billion. The company estimates that its proved reserves at year-end totaled 1.47 billion barrels of oil equivalent and comprised 37 percent natural gas.

### Calor extends LNG fuel

Calor, the UK’s leading provider of liquified natural gas for fuel stations, has further enhanced its refuelling network for natural gas-powered trucks by upgrading its Aust LNG facility, near the southwest city of Bristol. As part of the Severn View motorway auto-stop area for the services company Moto, the Aust facility is located off the M48 motorway by the Severn River Crossing.

■

# France’s network gas firm GRTgaz outlines 10-year plan with LNG terminals set for some expansion

**LNG Journal editor**


**French plan upgrades at Montoir in West and Fos in South**

GRTgaz, the French natural gas pipeline network operator whose subsidiary Elengy operates three LNG import terminals, has outlined its 10-year development plan, including expansion and upgrades at the Montoir-de-Bretagne facility on the West Coast and at the two terminals near Marseille, where capacity will be more than doubled.

“For our network, an investment cycle is coming to an end and a new one is emerging, with projects that will not be individually the same size as programs such as Val de Saone, but will be more numerous, more varied and more connected,” said GRTgaz Chief Executive Thierry Trouve in launching the programme.

## Supply

French security of supply and the integration of the European and French markets were reinforced by the creation in May 2018 of a new gas import point at Oltingue in the Haut-Rhin department in Eastern France and commissioning of the Val de Saone pipeline and Gascogne-Midi projects that joined French gas markets in the North and the South.

“The completion of this major project, the last link in a decade of investments, realized within planned costs and deadlines, also allowed the creation of the Trading Region France (TRF) single market place in November 2018,” explained GRTgaz.

“This evolution, which ensures a single gas price in all regions of France, strengthens national solidarity and also the attractiveness of the French wholesale gas market. Our country now has all the assets to play a key role in the functioning of gas Europe,” stated the CEO.

France has four LNG terminals, Fos Cavaou with send-out capacity of 8 Billion cubic metres a year, Fos Tonkin with 3 Bcm a year, Montoir-de-Bretagne with 10 Bcm and since 2016 the Dunkirk facility with 13 Bcm.

“Their operators are considering extension projects, which may have repercussions on the transmission network,” said GRTgaz.

Three of the terminals - Fos Tonkin, Fos Cavaou and Montoir-de-Bretagne - are operated by Elengy within France’s Engie group.

GRTgaz said the Fosmax consortium that owns the Fos Cavaou terminal is considering plans to more than double send-out capacity from 8 Bcm to 16.5 Bcm in two phases from 2022 to 2024.

These developments may require work on related pipeline connections such as Saint-Martin-de-Crau and the doubling of the Rhone pipeline system between Saint-Martin-de-Crau and Saint-Avit (Eridan project) and the doubling of East Lyonnais capacity.

“The works identified on the GRTgaz network project could be carried out subject to approval by the regulator and if Fosmax concludes the commercial agreements necessary,” said GRTgaz.

Elengy plans to increase the capacity of the Montoir-de-Bretagne terminal from 10 Bcm to 12.5 Bcm in 2022, with the possibility of building a new storage tank in 2024.

To accommodate this new Montoir LNG capacity, it would be necessary to adapt the compressor station of Auvers-le-Hamon, to double the Maine artery between Nozay (Loire-Atlantique) and Cherre (Maine-et-Loire) and if necessary, have an inter-connection between Chemery (Loir-et-Cher) and Dierrey.

Fos Tonkin is also contemplating expansion of LNG capacity by 1 Bcm from 2021.

The country is additionally upgrading its natural gas storage. It currently has 12 storage facilities in operation for a total volume of 137.9 terawatt hours, which is one third of the French annual gas consumption.

“Their operators are considering investment projects aimed at maintaining the performance of these sites,” said GRTgaz.

“Storengy has started the commissioning of capacity at the Hauterives site until 2019. This increase has no impact on GRTgaz's transmission network. The site will, however, benefit from the commissioning of the Val de Saone project in 2018,” explained GRTgaz.

In the meantime, the Geomethane company has announced the suspension of its renovation project for the Manosque storage facility (Alpes-de-Haute-Provence), which aimed to increase its injection and withdrawal capacity.

■

# Wood and KBR combine to win Shell engineering design contract linked to Prelude floating LNG

LNG Journal editor

Wood Group of the UK and KBR of the US have won a contract to deliver integrated front-end engineering and design for Royal Dutch Shell's Crux project comprising the construction of a platform and gas export pipeline located offshore Western Australia and linked to the Prelude floating LNG venture.

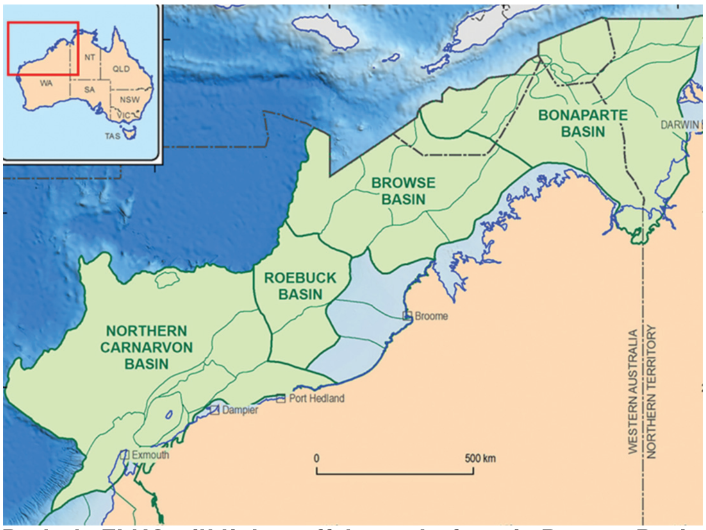
"The Crux facilities will be an important source of backfill gas supply to the Shell-operated Prelude FLNG facility," said Wood.

The remotely operated facilities will include a not normally manned (NNM) platform concept for Crux to dry the gas and transport gas-condensate to Prelude via a new 160km multiphase gas pipeline.

## Value

The Wood and KBR engineering services, with a value put by Wood in the multi-million dollars bracket, will be delivered over 18 months by teams based in Perth, Western Australia, and supported by Wood's Kuala Lumpur resource base.

The teams will provide a single integrated FEED plan for the Crux topsides, jacket, export pipeline and subsea pipeline end manifold.




**Prelude FLNG will link to offshore platform in Browse Basin**

Wood said itself and KBR had worked in the Australian energy industry for a long time, combining their collective strengths in subsea engineering and offshore gas processing facilities.

"This contract win to deliver the next generation of offshore facilities for Shell Australia demonstrates our unrivalled subsea pipeline expertise and offshore engineering capabilities," said Robin Watson, Wood's Chief Executive.

"Wood has extensive experience in delivering technically complex subsea engineering projects in Western Australia," he added.

"We are committed to expanding our portfolio in the region, developing local content by investing in industry talent, resources and supply chain," stated Watson.

Wood also provides specialist consultancy services for flexible riser integrity management to the Shell-operated Prelude FLNG facility.

Stuart Bradie, KBR President and CEO, said the Houston-based company was committed to adding value for its customers.

"That's why we are delighted to partner with Wood to bring together two industry leaders to deliver one world-class complimentary team whilst continuing our long relationship with Shell and Perth, Australia," added Bradie.

The Prelude FLNG hull will add 3.6 million tonnes per annum of LNG to Australian output when it starts commercial operations.

Shell and minority shareholders, including Inpex Corp. of Japan, have said that the gas wells have been opened and the initial phase of production has commenced.

Prelude is the first deployment of Shell's FLNG technology and comprises a 488-metre long floating facility extracting and liquefying gas at sea before it is exported to customers.

The FLNG hull is located about 475 kilometres north-northeast of the city of Broome in the north of Western Australia.

It is the world's third FLNG venture to start operations after one developed by Petronas of Malaysia and a second offshore Cameroon in West Africa.

## ABS launches guide for LNG tank barges for builders

The American Bureau of Shipping, US classification society, has launched a new guide for liquefied natural gas tank barges with remote control and monitoring of essential systems.

The ABS guide released by the Houston-based class society provides guidance to assist shipyards and barge operators.

"The guide provides requirements for the design and construction of barges equipped with various degrees of automation, remote control and monitoring of essential systems supporting cargo management," said the ABS.

"The barges may be unattended and controlled primarily from the towing vessel's navigation bridge," it added.

Gas as fuel has become an increasingly popular option for many shipowners looking to comply with environmental regulations and gain new operational efficiencies.

LNG tank barges for functions such as bunkering are key to helping expand the LNG supply chain and advance the adoption of LNG as a maritime fuel.

"We are focused on developing practical guidance and solutions that respond to the challenges faced by owners and operators while ushering in new concepts and advancing the latest technologies," said Patrick Janssens, Vice President of ABS Global Gas Solutions.

"The guide is intended to be used in conjunction with the ABS Rules for Building and Classing Steel Barges, ABS Rules for Building and Classing Marine Vessels and the ABS Rules for Building and Classing Steel Vessels for Service on Rivers and Intracoastal Waterways," he explained .

# South Korea to proceeds with its long awaited shipyards overhaul

**LNG Journal editor**

**South Korea Development Bank Chairman Lee Dong-gull**

South Korea's shipbuilding industry, the largest builder of LNG carriers, is advancing with plans for consolidation and an overhaul organized by state-run Korea Development Bank, with Hyundai Heavy Industries, the world's largest shipbuilder by sales, being offered the bank's controlling stake in Daewoo Shipbuilding and Marine Engineering.

The bank is Daewoo Shipbuilding's main creditor, with ownership of a 55.7 percent stake, and has agreed to sell its shares to Hyundai.

### Bank guidance

The value of the transaction is estimated at 2 trillion won ($1.78 billion) and marks a major change in how the South Korean shipbuilding industry will operate in the future and reduces the field of competition from three large players to two, Hyundai and Samsung Heavy Industries.

The consolidation move comes as Qatar, one of the main customers of the Korean yards in recent years, is planning to order at least 40 new LNG carriers to transport an additional 30 million tonnes per annum of production as part of its expansion plans at Ras Laffan.

However, South Korean shipbuilders, once a cornerstone of the country's economic growth and job creation, have suffered mounting losses in the past few years, caused by an industrywide slump because of an over-supply of vessels and tough competition from rival shipbuilders in China.

Under a proposed deal outlined at the end of January, Korea Development Bank would transfer its Daewoo Shipbuilding shares to Hyundai and also buy 1.5 trillion won (US$1.35 billion) worth of Hyundai stocks to be issued later.

The state lender has also agreed to consider extending 1 trillion won ($890 million) in financial aid to the new owner of Daewoo.

In return, Hyundai would be split into two entities, with one part of it listed on the Seoul stock market.

"We have proceeded with the merger and acquisition process first and have signed a memorandum of understanding," said Korea Development Bank Chairman Lee Dong-gull.

"We are in contact with Samsung Heavy as another potential buyer and to see if it is interested in Daewoo Shipbuilding as well," he said.

The bank Chairman stated that he would choose a final bidder later after assessing a proposal from Samsung if it wishes to make a bid.

# American Bureau of Shipping passes Dalian LNG fuel designs

The American Bureau of Shipping, the US classification society, has granted approval to two Chinese designs related to ship fuel for vessels powered by liquefied natural gas being constructed by the Dalian Shipbuilding Industry Group Co.

Dalian Shipbuilding's facilities are in the northeast of China and include the Changxing Island yard and several others located about 10 kilometres from the container port of Dalian in northeast Liaoning province.

The Chinese company, listed on the Shanghai stock exchange, is able to undertake the design and construction of ships of various types and tonnages from fishing vessels to very large crude carriers (VCCCs) of 300,000 tons in deadweight, container ships and large-scale LNG carriers.

ABS said it has granted approval in principle to Dalian Shipbuilding LNG-fueled designs for a 208,000 dwt bulk carrier and a concept for a 260,000 dwt Very Large Ore Carrier (VLOC).

"ABS has extensive experience of LNG as a marine fuel and it is a privilege to work closely with DSIC on these projects," said Patrick Janssens, ABS Vice President for Global Gas Solutions.

"China shipbuilders have a fantastic record of innovation in LNG and, as a recognized global leader in gas, ABS is proud to assist these significant industry technological developments," added Janssens.

Both LNG-powered designs incorporate a Type C LNG fuel tank in the open area of the aft deck, which Dalian Shipbuilding said minimizes the influence on the arrangement of the deck house and increases cargo capacity.

DSIC believes the optimized aft deck integrated arrangement achieved the modular design concept for the LNG gas supply system, safety system and filling system and makes for convenient installation and maintenance.

# Vietnamese LNG import terminal and power plant project advances at site on southern Mekong Delta

**LNG Journal editor**

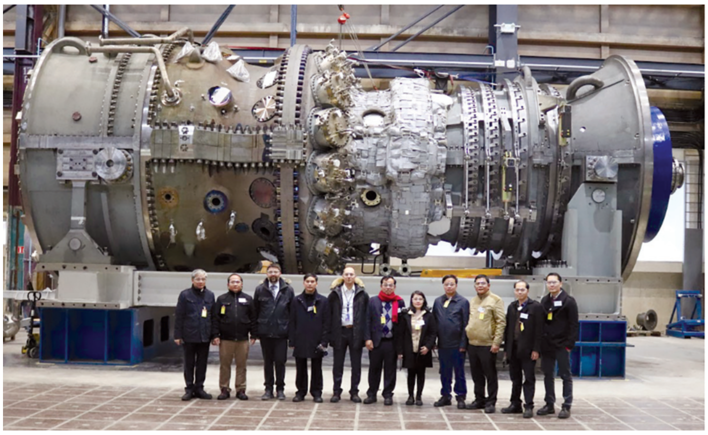
Vietnam is making progress on a project to construct a liquefied natural gas import terminal with an associated power plant in Bac Lieu Province in the southern Mekong Delta and the venture is being developed with full foreign infrastructure investment.

The project is in the hands of a joint venture comprising Delta Offshore Energy, a European-led firm, and the French power plant manufacturing unit and technology centre in Belfort, northeast France, of US company General Electric.

## Plant tour

Vietnamese provincial leaders from Bac Lieu have visited GE's Belfort facility to view the equipment for the power plant with planned output of over 3,000 megawatts.

The first phase of the project will see investments of around $1 billion in Vietnam's power sector with construction expected to start in 2019 in the venture with four distinct phases through to



**Vietnam's provincial delegation visits GE's Belfort facility**

2026. Ian Nguyen, Director of Origination and Government Relations for Delta Offshore, said a memorandum of understanding has been signed with the Bac Lieu provincial authorities opening the way for the first ever foreign direct investment project approval for Vietnamese energy infrastructure.

"Our investment model will be the predominant investment template going forward. The existing Public-Private Partnership model is obsolete given Vietnam's fiscal reality as debt levels approach the National Assembly's imposed ceiling and is re-enforced by Vietnam's sovereign credit rating threshold," explained Nguyen.

He said the GE-sponsored visit to the Belfort plant was a great success and included leaders from Bac Lieu as well as the central government.

The Vietnamese delegation met Christian Noacco, Managing Director of GE Belfort and other management members, to obtain insight into the latest Combined Cycle Gas Turbines technology from GE.

"GE is looking forward to deploy its proven and most efficient 9HA gas turbines to enable affordable and clean power for Vietnam," said Lan Phung, Country Director (Vietnam) of GE Gas Power.

"This visit will also help the Vietnamese authorities in understanding and appreciating the benefits of having cleaner energy from natural gas and LNG to power, thus enhancing their confidence in implementing the Bac Lieu LNG-to-power project and in planning the new national power development policy for period 2020-2030," he added.

Duong Thanh Trung, Chairman of the Bac Lieu Province Committee, thanked GE and Delta Offshore.

"The tour visit has particularly strengthened the confidence of myself and my fellow delegates in the advanced technology which we believe would be deployed in the project in Bac Lieu Province as promised to the Prime Minister of Vietnam at a meeting with the project investors in July 2018 in Hanoi," said Duong. ■

# Murphy Oil plans Malaysian LNG spending as Petronas FLNG hull aims for 2020 start-up

Murphy Oil, the US exploration and production company whose Rotan natural gas discovery offshore Malaysia is the subject of a floating LNG joint venture with state energy company Petronas, said the FLNG project was high on its investment plans as it reported its fourth-quarter results.

Murphy said net fourth-quarter income was $112 million and annual net income was $411 million.

The company added that it was allocating around $360 million of capital to its global offshore assets of which 60 percent will be spent in the Gulf of Mexico, 30 percent in Malaysia, Vietnam, and Brunei, and the remainder in Canada.

"The capital in the Gulf of Mexico is primarily related to field development projects. In Malaysia, the 2019 capital is primarily related to the Block H FLNG project which is expected to come online in 2020," said Murphy.

Murphy, based in the town of El Dorado in the southern US state of Arkansas, is contributing its Block H reserves offshore Malaysia to the FLNG venture.

Its partner Petronas, which successfully started up the world's first production hull, the "PFLNG Satu", over the stranded Kanowit gas field offshore the state of Sarawak, is leading a similar project with Murphy and it is scheduled to come on stream next year.

Murphy's FLNG venture is focused on the deepwater Rotan gas field, about 80 miles offshore Sabah, the Malaysian state occupying the northern part of the island of Borneo.

The Rotan gas well was discovered by Murphy in 2007. The Rotan field FLNG vessel will be designed to produce 1.5 million tonnes per annum.

Murphy also provides gas to the Malaysia LNG complex at Bintulu via a gas sales contract with Petronas for volumes up to 250 million cubic feet per day.

"In Malaysia, capital is primarily related to the Block H FLNG project which is expected to come online in 2020, in addition to development drilling projects related to Gumusut-Kakap and Sarawak," said Roger W. Jenkins, President and Chief Executive Officer. Murphy said Malaysian and Brunei production in the fourth quarter averaged 46 million barrels of oil per day equivalent.

Block K and the Sarawak field averaged 28,000 barrels of liquids per day, while Sarawak natural gas production averaged over 99 million cubic feet per day.

Murphy's proved reserves increased by 17 percent to 816 million barrels oil equivalent, with 57 percent liquids-weighting.

"It was a really good year for Murphy with our net income at the highest level in four years. We continued to benefit from our diverse, growing, oil-weighted portfolio," said the company. ■