LNG Unlimited

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BP lends resource support to Alaska for LNG project advance

UK company has already played critical role in state, says Governor

Our Asia-Pacific editor

BP's head of Alaska operations Janet Weiss gave backing

Alaska Governor Bill Walker said North Slope natural gas producer BP of the UK had joined ConocoPhillips in lending support and giving assurances to the Alaska LNG project, soon to be taken over by the state-backed Alaska Gasline Development Corp.

Walker said BP's head of Alaska operations, Janet Weiss, and the head of ConocoPhillips in the US state, Joe Marushack, had reiterated their support in writing for the Alaska LNG venture and the state's efforts to take the lead on that project in the coming months.

Integral

"BP and ConocoPhillips have played an integral role in developing Alaska's AK LNG project," Walker said.

"With their assurance that gas will be available for the project, the state can now move forward in its pursuit to monetize Alaska's vast and proven reserves of natural gas," he said before leaving Singapore at the end of a two-nation Asian tour to promote Alaska LNG.

Walker said BP and ConocoPhillips had reaffirmed their alignment on the Alaska project and their full cooperation in the transition to state leadership.

The two companies also voiced their support for AGDC's intended efforts to file a US Federal Energy Regulatory Commission application, to seek confirmation of the project's federal tax exempt status and other important project issues.

"As AGDC transitions to a position of leadership on the Alaska LNG project, it is absolutely critical that we have the support of the producers in these efforts," Walker said.

"This letter outlines that support and sends the message that Alaska LNG is moving forward," he added.

ConocoPhillips and Alaska have also taken steps to form a joint venture "aimed at facilitating the marketing of LNG" from the huge reserves of the North Slope.

Walker explained the venture in a speech to an LNG conference in Singapore, saying the move was part of a process for a North Slope-based project that will progress towards positioning the LNG project for a decision on front-end engineering and design.

Walker said the state, through AGDC, and ConocoPhillips had executed a memorandum of understanding regarding negotiations to form a joint venture company that could facilitate marketing LNG from Alaska.

Walker was recently in Singapore and South Korea where he had held talks with executives of the largest LNG buyers.

ConocoPhillips, BP of the UK and ExxonMobil had decided earlier in 2016 to stop further large investments for now in the Alaska LNG project, control of which is scheduled to be passed in December 2016 to AGDC.

The December takeover by the state would follow a transition agreement to be signed in October with the three majors.

That transition accord would enable all three energy majors to alter their status in the venture in which they each hold a 25 percent stake, along with AGDC.

Members

The AGDC board also had three new members appointed, Warren Christian, David Wight and Hugh Short. They still have to be confirmed by the state legislature before joining two other public members, Dave Cruz, and Joey Merrick, on the board.

The two commissioners on the AGDC board are Department of Labor and Workforce Development Commissioner Heidi Drygas and Department of Transportation and Public Facilities Commissioner Marc Luiken.

■

UNLIMITED AGENDA

Fluxys Belgium sees fall in Zeebrugge LNG carrier traffic offset by trucks surge

Our Europe editor

Fluxys Belgium, the owner of the Zeebrugge liquefied natural gas import terminal, said it may build a third jetty for small-scale LNG carriers as earnings showed a fall in large vessels delivering to the facility was offset by truck-loadings soaring by almost 40 percent.

Zeebrugge has joined other regional terminals in launching the loading of LNG for tanker trucks as a revenue alternative to large-scale ship deliveries.

Owner may build a third jetty for small-scale LNG tankers

Record

Fluxys said it had 772 truck loadings at the terminal in the first half compared with 556 loadings in the same period last year, an increase of 39 percent. The trucks supply the imported LNG to fueling stations and industrial customers.

"With a view to minimizing waiting times for LNG trucks in the future, Fluxys LNG is looking into the construction of a second loading station at the terminal in 2017," the company said.

During the first half Fluxys also invested 54.2 million euros ($60M), mainly for a fifth storage tank and a second jetty at the Zeebrugge LNG terminal.

Construction of the additional storage and new jetty stem from the 20-year contract for the provision of trans-shipment services from 2018 onwards for the Yamal LNG plant in Arctic Russia that will ship cargoes through the Belgian port during winter when the Northern Sea Route to Asia is closed.

"The second jetty at Zeebrugge will also enable the facility to receive even the smallest LNG vessels," Fluxys said.

"The jetty is set to be commissioned in the fourth quarter of 2016," the company added.

Fluxys said the success of small-scale LNG operations were expected to continue.

"In addition to handling large LNG volumes, the Zeebrugge LNG terminal is diversifying its offer to respond to the new and expanding market for small-scale LNG," it said.

"The number of loading operations involving small LNG vessels continued at the same level as last year. A market test showed that there is demand for additional options for loading small LNG ships," Fluxys added.

The company said it was, therefore, looking into "expanding its small-scale LNG services, with the construction of an additional (third) jetty being one of the possibilities."

Other investments by Fluxys covered the construction of transmission pipelines such as an 18-kilometre spur between Tessenderlo and Diest to be commissioned before the end of 2016.

Funds were also put into the upgrading of two parallel pipelines in Ravels and Oud-Turnhout on the north-south transmission route running through Belgium.

The Fluxys Belgium group generated a turnover of 237.8 million euros ($267M) in the first half of 2016 compared with 262.1M euros in the same period of 2015, a decrease of 9.3 percent.

"In accordance with regulation, this drop in regulated turnover is mainly the result of a number of authorized costs in decrease, namely operating expenses, financial expenses and the authorized return.

"The tariff proposal for the 2016-2019 regulatory period sets out a new reference framework for Fluxys Belgium with regard to the authorized manageable expenses.

"By controlling its operating expenses and focusing on efficiency, Fluxys Belgium has managed to achieve these new regulatory objectives," the company stated.

In other activities, Fluxys said that since January 2016 customers have been able to book both transmission capacity and hub services for buying or selling on the Belgian gas trading platforms.

"To this end, the company took over the hub services of its sister company Huberator in late 2015, and the transfer on 1 January was accompanied by lower prices for these services.

"The number of active traders on the Zeebrugge Beach and ZTP gas trading places has continued to rise," it said.

Fluxys also noted that The Netherlands intended to gradually phase out its export of low-calorific gas (L gas) between 2020 and 2030. ■

French operator Elengy improves contracts for truck-loading and boosts driver training

Elengy, the operator of three French LNG import terminals, said it had improved its LNG truck-loading contract, allowing more flexibility and access to its loading stations at the Atlantic coast terminal of Montoir de Bretagne and at Fos Tonkin near the Mediterranean port of Marseille.

The subsidiary of French energy company Engie said that three years after the launching of its first LNG truck-loading service it was introducing its new procedures. The revised contract allows greater flexibility with access to both the Montoir and Fos terminals and allowing unused subscriptions to be postponed to later years, or transferred from one terminal to the other without extra costs.

"The optimization of the scheduling rules also take into account the capacity increases implemented this year on both terminals, to 12 trucks per day at Montoir and eight at Fos, or around 6,000 trucks per year," Elengy said.

The French terminals operator has also improved safety training for drivers using the loading bays.

"Safety and support of the partners have been strengthened by implementing a mandatory certification of the drivers after a short training course, making the operations easier," the company explained.

"Truck approval processes have also been eased, making it possible for multiple trucks to be approved simultaneously," it added.

The Montoir terminal began truck loading in 2013, one year after the Fos start-up.

The company noted that the optimization of the scheduling rules takes into account the capacity increase at both terminals this year. ■

Engie supplying cargoes for Beijing Gas winter security

French energy and utility company Engie said it was selected by Beijing Gas Group after a tender process to supply the Chinese capital for a second year with its additional winter natural gas needs in the form of LNG deliveries.

Engie said Beijing Gas required around 900 million cubic metres of natural gas, the equivalent of 660,000 tonnes of LNG, to supplement supplies during the winter months for its customer requirements.

PetroChina's Tangshan import terminal will receive the cargoes.

The Tangshan terminal is in the Caofeidian Industrial zone in Hebei Province, southeast of Beijing, and started commercial operations in December 2013.

The French company said it would deliver 10 cargoes of LNG to Beijing Gas over the period from November 2016 through February 2017.

The LNG volumes will be stored, regasified and transported into Beijing's gas network.

"LNG deliveries will notably involve floating storage in order to manage the winter peak-shaving and flexibility needs of BGG," Engie said.

"This deal further cements Engie and BGG's relationship, following the maiden import of LNG by BGG from Engie in 2015 and ensures the security of supply for this winter in Beijing," the French company stated.

Philip Olivier, Chief Executive of Engie's Global LNG business, said: "This new agreement between Engie and BGG shows the fruitfulness of the relationship that both companies have built over the last years.

"We are confident that our co-operation will contribute to cover China's growing energy needs."

Canada tells Pacific Northwest approval with strict conditions is best it can do

Our North America editor in New York

BC Premier Clark speaks watched by federal ministers

The provincial government of the Canadian Province of British Columbia said it was not prepared to offer better tax deals just to get the NorthWest LNG project built and to offset the high expected costs of 190 conditions imposed by the federal government.

BC Premier Christy Clark said the liquefaction plant and associated infrastructure to be built on Lelu Island near the port of Prince Rupert were now only awaiting the final investment decision by Malaysian energy company Petronas and its Asian joint venture partners.

Clark said her government would not re-open a previously signed project development agreement on taxes and environmental conditions just to help Petronas reduce costs.

"We have signed the agreement," Clark said. "It is done and dusted," she added.

"Now that we've finally cleared the last hurdle for it to go ahead, it's really just a matter of watching the market and hoping the company and its customers will decide it's healthy enough to move ahead," Clarke stated.

The interim leader of the Conservative Party of Canada and Leader of the Opposition, Rona Ambrose, said the federal government of Prime Minister Justin Trudeau had imposed too many conditions on the LNG joint venture.

"Conditional approval is one step forward, but bogging it down with extra process is two steps back," Ambrose said.

"The prime minister must stand with unemployed workers who need jobs. Will he do the right thing, get shovels in the ground, and get these people to work?" she asked.

Other opposition MPs accused the federal government of slipping a poison pill into the approval of the project in the form of very strict limits on greenhouse gas emissions.

That's as an alliance of Native North American First Nations in the province of BC again voiced its support for the approval of the Petronas project.

"Our first priority is that LNG projects in our province are approved for the right reasons," said the First Nations LNG Alliance.

"It is vital that we strive to protect our environment, while at the same time pursue sustainable economic development opportunities for First Nations communities and our province," said the Alliance whose members are participating in or are supportive of LNG projects.

Conditions imposed on Asia-led venture and how greenhouse gas cap will work

The mitigation measures attached to the Pacific NorthWest LNG project in British Columbia by the Canadian Environmental Assessment Agency cover 29 pages and include for the first time a cap on greenhouse gas emissions.

The project's 190 legally-binding mitigation measures cover every aspect of building from wetlands and flora protection near the site to fish and sea mammals in the surrounding area.

The conditions also include measures at the liquefaction plant, for the hundreds of pieces of equipment, dozens of buildings, the shipping terminal, the vessels themselves and a suspension bridge to help protect feeding grounds for young salmon.

As regards the GHG emission measures, the regulator said that at the commissioning, for example, of the second liquefaction processing Train the annual average emissions intensity should be less than or equal to 0.22 tonnes of equivalent carbon dioxide per tonne of LNG produced.

With two Trains in operations, the plant is allowed to emit no more than a total of 3.2MT of equivalent carbon dioxide per calendar year.

"At the commissioning of Train 3, the proponent shall adhere to an annual average emissions intensity of less than or equal to 0.21 tonnes of equivalent carbon dioxide per tonne of LNG produced and shall emit no more than a total of 4.3MT of equivalent carbon dioxide per calendar year," the report said.

The Canadian Association of Petroleum Producers was one of the key bodies that welcomed the LNG decision amid months of rallies in some cities against oil and gas and pipeline projects.

"The Government of Canada's approval of the PNW LNG project will open Canadian energy to new global markets, striking a balance between growing the national prosperity generated by Canada's energy sector while delivering on government's commitment to lower GHG emissions," the Association said.

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NEWS NUDGES

Denmark-Korea LNG accord

Kosan Crisplant of Denmark, project corporation supplier of gas equipment, has signed a detailed cooperation agreement with Korea LNG Solutions. The Danish and Korean companies will co-operate on the development, manufacturing and sale of LNG bunkering equipment for the small-scale and marine markets in Korea over a four-year period. The collaboration between the two was initiated in Copenhagen with the intention of exploring possibilities within the LNG market. "We have a lot to gain from this collaboration in the Korean market while at the same time contributing to the industry as a whole," said Kosan Crisplant LNG manager Lars Sall.

Jera LNG trade debut

Japanese company Jera Co Inc., a joint venture between Tokyo Electric Power and Chubu Electric who have annual LNG purchases amounting to 40 million tonnes, has made its trading debut by agreeing to deliver its first cargo outside of Japan. According to traders, Jera has agreed to sell on supplies of Indonesian LNG to the South Korean Kwangyang import terminal, operated by steelmaker Posco, with a delivery date some time in December.

Japanese city-gas sales

The leading six city-gas companies in Japan sold volumes of 2.91 billion cubic metres of natural gas last month, the equivalent of 2.15 million tonnes of LNG, a rise of 2.6 percent compared with August 2015, according to the Japan Gas Association. The biggest rise was in the industrial sector where regasified LNG sales rose 4.6 percent to 1.80 Bcm.

Chinese test first floating LNG production hull in Nantong shipyard ordered by Exmar

Our Asia-Pacific editor

Testing carried out in front of class societies and others

The Chinese shipbuilder, Wison Offshore and Marine, has completed performance testing in the port of Nantong on a floating natural gas liquefaction hull ordered by Belgian shipping company Exmar for a project in the South American nation of Colombia that has now been cancelled.

Wison said the tests marked the first time LNG has been produced on board a floating facility.

Yangtze base

The tests were carried out at the Nantong yard located on the northern bank of the Yangtze River in the eastern Jiangsu province.

The shipyard said the performance test was carried out in the presence of classification societies, Exmar executives and other parties.

"During the 72-hour performance test, the excellent performance of the FLNG hull ensured all key design requirements and production capacities (guaranteed performance) were achieved for the unit's operational effectiveness," Wison said in a statements.

The FLNG project is being delivered by Wison under an engineering, procurement, construction, installation and commissioning contract with the Belgian shipping line.

"All systems on the FLNG hull have been commissioned and tested without leaving the shipyard by using LNG without connection to a pipeline.

"Conducting gas trials and performance testing in the shipyard shortened the time required for project completion," Wison explained. Wei Huaqing, Project Manager for the FLNG project at the Chinese yard, said the successful completion of the performance tests verified Wison's comprehensive project management capabilities.

"The project has also cemented Wison's position in floating LNG turnkey projects around the world," Wei said.

Exmar is seeking to place the Wison-built FLNG hull with another project developer, though has made no recent announcements on the matter.

The Belgian shipping line is also currently in talks with Royal Vopak of the Netherlands, the global petroleum storage company, for the sale of its LNG Floating Storage and Regasification Unit (FSRU) business.

Exmar has been a pioneer in the FSRU and floating liquefaction markets and is currently co-owner and/or operator of 10 FSRUs, as well as one FSRU under construction and the FLNG production hull in Nantong.

Exmar, controlled by Nicolas Saverys, signed a settlement agreement in 2016 with Pacific Exploration and Production, the successor company to a firm called Pacific Rubiales, which had planned the Caribbean FLNG project in Colombia.

The LNG production venture on Colombia's Caribbean coast had originally been set to become the world's first FLNG production plant.

It was to process feed-gas delivered by pipeline from onshore to a hull berthed at a jetty. The gas would have come from the onshore Creciente natural gas field.

Exmar and the FLNG venture had signed a 15-year charter agreement in 2012 for the hull with capacity to produce 500,000 tonnes per annum of LNG and with storage for 16,100 cubic metres.

The marketing and trading arm of Russia's Gazprom in 2013 even signed a contract with Pacific Rubiales for 500,000 tonnes per annum of cargoes from the project over five years.

> "During the 72-hour performance test, the excellent performance of the FLNG hull ensured all key design requirements and production capacities were achieved ..."
>
> *- Wison Offshore and Marine*

Greek-led project for LNG fuel in major trading vessels to bring Shell on board as supplier

Our Europe editor

Arista Shipping of Greece and its partners in a joint venture to develop more liquefied natural gas-powered vessels said the Greek-based project would also work with Royal Dutch Shell to investigate potential fuel supply options and requirements.

The companies involved in the venture to develop a dry bulk carrier concept that uses LNG as fuel already include the American Bureau of Shipping, LNG storage technology company Gaztransport and Technigaz (GTT) and Finland's ship propulsion maker Wartsila and vessel designer Deltamarin.

Progress

Shell is already progressing with LNG bunkering infrastructure in Northwest Europe and at different ports around the world that will accelerate the widespread adoption of LNG as a marine fuel.

ABS to approve Greek ship designed by Deltamarin

Arista and its partners explained that one of the examples is the Gate LNG terminal in Rotterdam where Shell has begun break-bulk operations, small-scale ship deliveries to Northwest Europe and plans to deploy a bunkering vessel.

The Arista, ABS, Deltamarin, GTT and Wartsila joint development project (JDP) is advancing under the title "Project Forward".

The goal is to develop a Kamsarmax bulk carrier design to be the first of this type suitable for worldwide services powered by LNG in compliance with the International Maritime Organization's Energy Efficiency Design Index 2025 standards and emission reduction levels.

This landmark design will be the first LNG-fueled cargo ship capable of full-range operations.

"The widespread adoption of LNG in the marine sector has to overcome obstacles related to bunkering infrastructure," the venture partners said.

Even though LNG import terminals are available at many ports, the barges and infrastructure needed to undertake the bunkering operations are still at an early stage of development.

"Merchant shipping is under increased pressure of tight regulations on emissions from a range of sources and this will continue in future," says Arista Shipping Principal Alexander P Panagopulos.

"LNG is a cleaner burning marine fuel for shipping which can help ship owners and operators to reduce emissions of CO_2, sulphur, particulates and nitrogen oxides," Panagopulos added.

The Athens-based "Project Forward" venture ensures a very long sailing range on LNG, which can easily be adjusted to fit specific needs of each owner or trade pattern.

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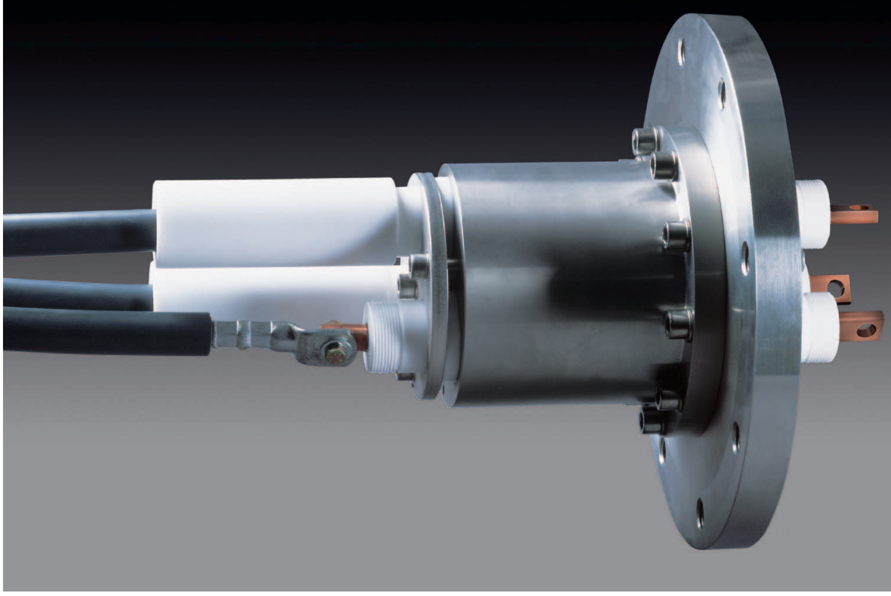

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RasGas is Awarded the highest rating by safety body

RasGas, one of the world's leading exporters of liquefied natural gas from its terminal at Ras Laffan in Qatar, has been awarded a five-star safety rating by one of the world's most respected regulatory bodies.

The rating was awarded to RasGas by the British Safety Council after a full Environmental Audit and the Occupational Health and Safety Audit.

RasGas is one of two world-class LNG producing companies in Qatar, the other being Qatargas. It also operates an integrated global shipping fleet consisting of 27 long-term chartered LNG vessels.

"At RasGas we are deeply committed to delivering cleaner energy to our customers in a manner that is safe, efficient and preserves the environment," said the Chief Marketing & Shipping Officer of RasGas, Khalid Sultan R. Al Kuwari.

"This is a fundamental corporate goal, and the British Safety Council's rating is testament to the success of our efforts to maintain these rigorous standards," Al Kuwari added.

The RasGas five-star safety standard was awarded after a quantified, objective evaluation of the environmental, and occupational health and safety management systems of the shipping and LNG transportation functions.

The British five-star grading for RasGas is the highest possible rating that can be achieved.

The BSC is a UK government-regulated awarding organisation and has developed a full suite of health and safety qualifications in a national and international framework. ■

Swedish shipping line orders two LNG-ready ships from China yard

Our Europe editor

The Swedish Sirius shipping line, owned by the Backman family, has ordered two vessels from the Dingheng Shipyard in China which will be ready to have liquefied natural gas propulsion when required.

Sirius said its order is for two 7,999 tonnes deadweight oil-chemical tankers at the yard in the eastern Jiangsu province.

Existing Sirius fleet includes LNG bunkering vessel 'Seagas'

Completed

The delivery of the two vessels is set for 2018. The ships will have ICE class 1A and will be equipped with the latest technology and comply with the future regulations, such as TIER III.

"The design is developed in co-operation between Sirius and FKAB, based on a proven hull design and fuel consumption.

"With this knowledge in hand, the vessel will be more optimized and the most efficient vessel in its segment," Sirius said. "LNG-Ready, the vessel is designed with a two-stroke main engine that is compatible to be converted to run on LNG.

"The deck strength and stability is designed so that two LNG tanks can be mounted on deck.

"The engines on board will be equipped with exhaust gas cleaning, HPSCR for the main engine and a Catamizor for the auxiliary engines," the company added. The Sirius fleet already comprises 11 modern chemical tankers operating in the North Sea and Baltic Sea trade and one LNG supply vessel in the port of Stockholm.

The company is the technical and crew manager of the LNG supply vessel "Seagas", which in July completed its 1,000th LNG-bunker operation. ■

US LNG highway stations completed for clean-fuel trucking on west coast

Clean Energy Fuels Corp. has opened its first public natural gas station in the northwest state of Oregon as part of its continued build-out of a countrywide network offering LNG fuel for the trucking industry.

The company said the addition of the station, located on Interstate 5 outside the town of Medford, gives customers the ability to drive the full south-to-north distance from San Diego in Southern California to Seattle in Washington State using what Clean Energy calls "America's Natural Gas Highway".

The latest station opened dispenses both LNG and compressed natural gas (CNG) and never closes.

Clean Energy said Matheson Trucking, a United States Postal Service contracted carrier, is using the station for its California to Seattle runs.

US oil tycoon T. Boone Pickens, one of the main advocates of LNG fuel for trucking, retains an interest in Clean Energy and founded its predecessor company, Pickens Fuel Corp.

"The addition of this station allows us the strategic advantage of being able to rely on natural gas throughout our entire distribution system," said Joshua Matheson, vice president of operations for Matheson Trucking.

"With an annual fleet distance of close to 36 million miles, we are always looking for ways to reduce greenhouse gas emissions, and being able to use natural gas, specifically for our Los Angeles to Seattle runs, will help us do just that," he added. Clean Energy also announced the opening of a private station in Wilsonville, Oregon, for customer Republic Services, the nation's second-largest solid waste management company.

"Our natural gas fueling infrastructure continues to grow as more and more fleets and consumers turn to natural gas," said Chad Lindholm, vice president of sales at Clean Energy, which is listed on the US Nasdaq stock exchange.

"By opening stations like Central Point and connecting the I-5 corridor, we can offer our customers the fuel and the infrastructure they need to make the transition to alternative fueling as seamless as possible," Lindholm added. ■

Driftwood LNG project builds team as execs from Cheniere Energy join their former CEO

Our North America editor in New York

Keith Teague is new Chief Operating Officer of Tellurian

The US Driftwood liquefied natural gas project of former Cheniere Energy Chief Executive Charif Souki has hired another Cheniere executive to take his Louisiana export venture forward.

Souki's LNG development company, Tellurian Investments, named R. Keith Teague as its new Executive Vice President and Chief Operating Officer.

Departure

Teague recently left Cheniere where he served as Executive Vice President of its asset group.

Souki's Driftwood LNG venture planned for near Lake Charles will be a major competitor to Cheniere's Sabine Pass LNG export plant, already operating on the Gulf Coast since February 2016 with two of a planned six processing Trains completed.

Driftwood is in the engineering design and pre-filing phase of the project to match Sabine Pass and produce 26 million tonnes per annum of LNG from six Trains.

The Federal Energy Regulatory Commission approved Driftwood's pre-filing report on June 6, 2016.

Souki's company expects construction to begin in 2018 and the project to become operational in 2022.

Souki announced in August 2016 that he had hired Cheniere's former London-based marketing executive Meg Gentle as Tellurian's and the Driftwood project's President and CEO "to build a liquefied natural gas powerhouse."

Tellurian was the company set up by Souki as a development and investment vehicle. He was later joined at the company by former BG Group LNG executive Martin Houston.

Souki left Cheniere under a cloud in 2015 before it came on stream amid disagreements with the new major investor in Cheniere, US billionaire and active investor Carl Icahn.

"Keith brings a tremendous amount of talent and expertise to our team," said his former Cheniere colleague and new President and CEO Gentle.

"At Cheniere, he was responsible for the development, construction and operation of the LNG terminal and pipeline assets.

"In this capacity, he oversaw the design and permitting of over 40 MTPA of liquefaction capacity in Louisiana and Texas, the delivery of the Creole Trail Pipeline, and the first two Trains at Sabine Pass ahead of schedule, on budget and at a very low cost compared to the rest of the industry," Gentle stated.

"He was successful building a team to manage the projects and he ensured a smooth transition from the construction phase to operations," she said.

Tellurian Chairman Souki added: "Keith will be an integral part of our management team and I look forward to working with him again to ensure the success of Tellurian's first project, Driftwood LNG." ■

US senators ask Energy Secretary if some of approved LNG projects can still be rejected

A group of a dozen United States senators from the Democratic Party in the Northeast and the Midwest has sent a letter to US Energy Secretary Ernest Moniz requesting a slowdown in the approval rate of liquefied natural gas export projects and asked if some of the 18 approved ventures could be rejected at a later date.

The letter expressed concern that LNG exports would increase domestic natural gas prices, noting that "more than 60 percent of 2015 natural gas production has been approved for export, but only a small fraction of that has actually been exported to date."

The senators or from Democratic strongholds such as Massachusetts, New Hampshire, Rhode Island and Michigan.

"The DoE has approved a substantial volume of LNG exports and continues to do so at an alarming rate," the senators said.

"As required by the Natural Gas Act, the DoE must ensure the public interest of each project. As of August 2016, the DoE had approved 18 export applications to non-Free Trade Agreement (non-FTA) countries totaling 14.44 billion cubic feet per day (bcf/d), or nearly 20 percent of 2015 domestic dry natural gas production," they said.

"The DoE has also conditionally approved another 0.8 bcf/d for non-FTA countries," they added.

"This total does not even include the natural gas that the US exports to Canada and Mexico by pipeline," they said.

"We have several reservations about this high volume of approved LNG exports, many of which we have raised in the past.

"Specifically, we are concerned that LNG exports will increase domestic natural gas prices, which would disproportionately harm domestic industries like the agricultural, electricity and paper, pulp and primary metal manufacturing sectors that will suffer from higher natural gas and electricity prices," they stated.

"Increasing the price of energy for US families would be especially damaging for low-income households that expend a higher percentage of their income on energy bills," they said.

"They would also disproportionately harm states or regions of the country that do not produce large amounts of natural gas," the politicians added.

The senators also asked if the DoE had the authority to withdraw approved applications, if the agency subsequently determines that LNG exports are no longer in the interest of the US public.

"If yes, under what circumstances would the DoE rescind approval? If no, is this something the DoE is considering as the agency approves new projects?" they said.

"Finally, we are concerned that the DoE does not sufficiently consider climate change when reviewing LNG export applications, which could undermine our ability to meet international goals agreed to in Paris.

"The newly finalized National Environmental Policy Act (NEPA) guidance from the White House asks agencies to consider effects of global climate change," they said. ■

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Chart Industries awarded US patent for LNG liquefaction process technology for plants

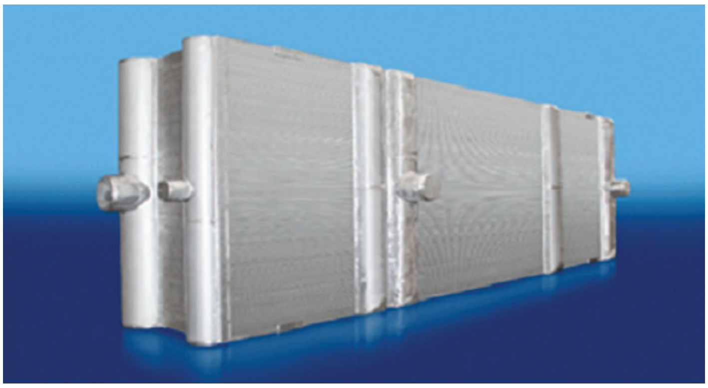
Our North America editor in New York

Chart Industries, the supplier of liquefaction, storage and fueling equipment to the LNG industry, said the United States Patent and Trademark Office had awarded the company a patent for its latest processing technology.

The US patent was granted to Chart's Integrated Pre-cooled Single Mixed Refrigerant (IPSMR) cryogenic liquefaction technology, developed by an in-house engineering team comprising Douglas Ducote, Vice President of Process Plant Technology, Timothy Gushanas, a process consultant, and James Podolski, a process engineer.

Renowned

Chart is known for its supply of equipment to small-scale and medium-scale LNG projects worldwide.



Process optimization is achieved through an improved refrigeration cycle using Chart's proprietary brazed aluminum heat exchangers

Chart also signed an agreement in 2015 to partner with the world's most successful US liquefaction plant builder, San Francisco-based and privately-held Bechtel Inc., on floating LNG projects.

Cleveland, Ohio-based Chart has most recently signed an accord to supply equipment to the US Magnolia LNG export plant in Louisiana and is also increasingly involved in the LNG storage and fueling businesses.

Chart said the now US-patented IPSMR technology is intended for use in the making of LNG, uses a mixture of light hydrocarbons and nitrogen to provide refrigeration.

"Process optimization is achieved through an improved refrigeration cycle using Chart's proprietary brazed aluminum heat exchangers (BAHX)," Chart explained.

"The IPSMR process allows clients to achieve maximum operating efficiency, economy and performance by 6-10 percent over other industry recognized single mixed refrigerant processes," Chart added.

While the oil price collapse has slowed the momentum of global demand for LNG, there are forecasts showing an upward trend for new liquefaction projects to be completed by 2020 and beyond, analysts said.

Chart pointed out that demand for natural gas continues to increase and liquefaction is vital for its transportation because LNG occupies 1/600th volume compared with its gaseous form.