

LNG Unlimited

LNG JOURNAL PUBLICATION

14 June 2016

Brazil starts bidding process to sell two LNG import facilities

South American energy giant puts regas infrastructure on divestment list

[Our South American editor](#)

Brazilian state-run energy company Petrobras has launched an international bidding process for the sale of its two liquefied natural gas import terminals, which have already received LNG cargoes from the new export plant at Sabine Pass in Louisiana.

The two import facilities are chartered Floating Storage and Regasification Units at Guanabara Bay in Rio de Janeiro state and at Pecem in the northeast state of Ceara.

Charters

Brazil has a third LNG FSRU located at the port of Salvador in the central Atlantic coast Bahia state since 2013 and which is not part of the sale process.

Both FSRUs import projects being sold include associated charters and onshore infrastructure connecting them to the natural gas network.

Petrobras is also selling gas-fired power plants linked to the floating LNG terminals.

The Brazilian FSRUs rose to prominence in 2016 when they received two of the initial commissioning cargoes from Cheniere Energy's Sabine Pass export plant.

Brazil is the world's largest gener-



Brazil's Pecem facility has offshore and onshore assets

ator of electricity from hydropower.

However, it set up the Rio and Pecem import facilities in 2009 and entered the LNG market to provide back-up from gas power during the summer months when the Amazon River and other hydro sources are at lower levels.

The sale of the LNG terminal is part of an asset restructuring first announced in June 2015 as Petrobras adapts to falling oil and gas prices and revenues from its huge offshore resources as well as a home-grown economic crisis.

The state oil company is aiming to sell \$14.4 billion in assets in 2016, while maintaining investment in other offshore infrastructure.

Petrobras recently completed the sale of assets in Argentina and in Chile for \$1.4Bln as part of its restructuring programme.

Petrobras in 2007 had contemplated setting up onshore LNG terminals to use its own natural gas resources sent ashore by pipeline, but the ventures, including one

backed by BG Group of the UK, never passed the planning stage.

The FSRU "Golar Spirit" is the vessel located at Pecem. The State Government in Ceara has previously studied setting up an onshore regasification terminal.

Using closed-loop regasification technology and over-jetty LNG transfer, the "Golar Spirit" has storage capacity of 129,000 cubic metres and is contracted to Petrobras until 2018.

The "Golar Winter", a carrier conversion constructed in 2004, has a regasification capacity of 14 mmcm/d and was initially located at Guanabara Bay near Rio.

'Experience'

However in 2011 Petrobras signed a 15-year time charter agreement with Exceleerate Energy of the US to provide an advanced FSRU, the "Experience" with 173,400 cubic metres of capacity for the delivery of 20 mmcm/d of gas to the south-eastern region of Brazil.

UNLIMITED AGENDA

EXPORTS

Angolan leader's daughter takes helm at Sonangol as LNG plant re-starts

2

FUEL MARKET

Yokohama and other ports put Japan on course for LNG fueling

3

ENGINEERING

Amec FW will construct LNG terminal for Indian east coast

5

STRATEGY

Shell to curb new investments in LNG in era of BG integration

6

REGULATION

US FERC gives permit to Elba Island LNG plant in Georgia

7

IMPORTERS



DNV GL signs framework deal with UK Grain LNG terminal

8

Meeting challenges you haven't even thought of yet.



New offshore LNG loading technology:
made to handle the toughest conditions.

Copyright © FMC Technologies, Inc. All Rights Reserved.

FMC Technologies

We put you first.
And keep you ahead.

www.fmctechnologies.com



Angolan President's daughter takes the helm of state energy firm as LNG plant re-starts

Our Europe editor

Angola LNG, one of the most troubled liquefaction plants ever built and operated by Chevron Corp., has resumed production and is shipping cargoes sold by international tender after a two-year shutdown.

Production at the facility had originally been scheduled to re-start in December 2015 following completion of modifications and repairs at the facility near the town of Soyo.

Single Train

The single-train Angola LNG plant, located near the Congo River estuary in the north of the country, has a capacity of 5.2 million tonnes per annum and can process 1.1 billion cubic feet of natural gas per day.

In April 2014, the plant experienced a failure in the flare blow-down piping system, resulting in an extended plant closure.

It cost an initial \$10 billion to build and is a joint venture involv-



Angola LNG is located on the Congo River estuary

ing Chevron with partners including the Angolan energy company Sonangol, BP of the UK, Italy's Eni and France's Total.

The official relaunch of the LNG plant comes as Angolan President Jose Eduardo dos Santos has just appointed his daughter Isabel dos Santos as head of state-owned Sonangol.

Angola, which is also Africa's leading oil producer because of supply outages caused by militant attacks in Nigeria's Niger Delta, said in April it would restructure Sonangol to "increase efficiency and profitability".

The Soyo facility was the world's first LNG plant built to be supplied solely with associated gas, whereby the natural gas is a by-product of crude oil production.

Feed-gas for the plant originates from multiple fields and operators offshore Angola.

"The first liquefied natural gas cargo after the shutdown has now been loaded at Soyo. It is being sold by an international tender," Angola LNG said in a statement.

According to the statement, production is continuing and Angola LNG expects to load further LNG and liquefied petroleum gas

cargoes as part of the plant commissioning and testing process.

Full handover and commercial operation of the plant from ALNG's engineering contractor Bechtel of the US will take place in "due course".

"The market has changed a lot while our plant has been shut down, but we are pleased to be able to deliver Angola LNG to the world and to take our place as a reliable and safe supplier in global LNG markets," said Artur Pereira, Chief Executive of Angola LNG Marketing.

The Angola liquefaction venture was first sanctioned in December, 2007, along with the Chevron-backed LNG import terminal near Pascagoula, Mississippi, in the US, to where much of the African LNG was originally destined to be delivered.

However, the US shale-gas boom altered the world LNG trading landscape and most of the Angolan LNG cargoes are being sold where the owners can place them at the best price.

Australian developer of two North American LNG export projects at centre of takeover talk

LNG Ltd of Australia, developer of two North American liquefaction plants in the US state of Louisiana and the province of Nova Scotia in Canada, has issued a securities exchange statement saying it was not aware of any takeover talks involving the company.

The statement to the ASX followed a surge in its shares of more than 65 percent in recent trading sessions.

LNG Ltd. is developing the medium-scale Magnolia LNG export plant near Lake Charles in Louisiana and the Bear Head project in Nova Scotia.

It also has a site lease agreement in the Australian port of Gladstone in Queensland for a possible coal-seam-gas-to-LNG ven-

ture called the Fisherman's Landing project.

LNG Ltd. additionally owns its own patented liquefaction processing technology system called the optimized single mixed refrigerant (OSMR) process.

"In response to an article in today's 'Financial Review', Liquefied Natural Gas Ltd. is not aware of or is in discussions in relation to a takeover," said the short statement.

LNG Ltd. has seen its shares fall over the past 12 months because of the LNG market slump and oversupply.

The company's market capitalization has subsequently gone from a high of \$2 billion a year ago to A\$300 million last week

and A\$543M on June 9 after the share surge.

The LNG Ltd. shares were last trading on the ASX at A\$1.09 from A\$4.30 in June 2015.

The company in April 2016 named Gregory M. Vesey from US major Chevron Corp. to replace founder Maurice Brand as Managing Director and Chief Executive based in Houston, Texas.

However, Brand will continue as an Executive Director of LNG Ltd. until his retirement scheduled for June 2017.

The Australian company said Vesey was bringing "a wealth of experience to this role, most notably through his 35 years with Chevron" in a number of senior executive roles.

Vesey was president of Chevron Natural Gas and Vice President of Gas Supply and Trading from 2011 to 2015 where he was responsible for Chevron's global LNG, natural gas, and natural gas liquids marketing and trading activity.

Vesey said at the time he was excited to join LNGL and lead the next phase of its project and corporate development.

"While the LNG industry is under pressure in the short term, the LNGL business model of mid-scale projects using its wholly owned OSMR technology combined with its portfolio of projects in Magnolia LNG, Bear Head LNG and Fisherman's Landing LNG enable the company to be successful globally," Vesey had said.

City-gas firm in Tokai region of Japan signs US LNG accord

Toho Gas, the Japanese utility and importer of LNG from nations such as Australia, Qatar, Indonesia and Malaysia, has added the US to its supply list after finalizing an agreement to buy three cargoes a year from the Cameron export plant being built in Louisiana by Semptra Energy of California.

Toho currently imports more than 2.5 million tonnes per annum of LNG and supplies city-gas customers in the Tokai region of central Japan.

The company said it had signed a firm agreement to receive 200,000 tonnes a year from a US subsidiary of Japanese trading house Mitsubishi Corp., one of three overseas investors in the Cameron plant along with Japan's Mitsui & Co. and French utility Engie.

The US Federal Energy Regulatory Commission in May 2016 authorized Cameron LNG to build two additional liquefaction Trains and five in total for almost 25 million tonnes per annum in production.

Semptra's existing LNG import terminal is being transformed into a liquefaction plant on the shore of the Calcasieu Ship Channel at Hackberry, Louisiana.

While Toho's other long-term LNG supply contracts are linked to the oil price, the Cameron cargoes will be priced against the US benchmark Henry Hub and with Mitsubishi supplying to shipping.

The US deliveries will begin in 2019 and last up to 20 years and contain a clause for destination flexibility.

"We strive for LNG procurement diversification, including diversification of the price-index, supply sources and types of contracts, to ensure a stable energy supply to customers at a competitive price," said Toho, an operator of 28,000 kilometres of Japan's natural gas pipeline network.

Yokohama and other ports put Japan on course for LNG bunkering services

Our Asia-Pacific editor

The Japanese Port of Yokohama plans to set up the nation's first liquefied natural gas bunkering operation under a proposal to promote more clean fuel use in the shipping industry.

The Japanese government is backing the plan along with Tokyo Gas, the third-largest LNG importer and owner of regasification facilities in Tokyo Bay.

Partners

Tokyo Gas said that another initial participant in the LNG bunkering project is Nippon Yusen Kabushiki Kaisha (NYK Line), one of the largest shipping companies in the world.

A meeting was held on June 9 in Tokyo involving Tokyo Gas, NYK Line, the Port of Yokohama and the Japanese Ministry of the Economy, Trade and Industry and the Ministry of Transport.

It emerged that plans were now under way to establish LNG bunkering working parties for other Japanese ports.

Tokyo Gas already operates an



Tokyo Gas has an LNG import terminal in Yokohama and NYK Line has tugboats operating with LNG as fuel

LNG import terminal in Yokohama and NYK Line has several tugboats operating with LNG as fuel.

"The committee will examine the state of the city's port, as well as the costs, technological needs and market factors involved in the project and will produce an infrastructure development plan," a statement said.

Measures to promote LNG as a maritime fuel and for vehicles such as trucks were included in Japan's plan announced in May 2016 to develop the LNG market.

As LNG use in shipping spreads

in Europe and North America, Japan is now moving forward to keep its shipping industry and ports at the forefront of the regulatory moves towards cleaner fuel and the creation of Emission Control Areas (ECAs).

The tougher environmental legislation to create the ECAs has already prompted a shift towards alternative fuels for ships over the past few years and a rise in the number of ships ordered to take LNG as a fuel, sometimes on a dual-fuel basis.

Japan's monthly data puts LNG spot cargoes average price at \$4.30/MMBtu

Japan said the price of spot liquefied natural gas cargoes imported into the country in May amounted to \$4.30 per million British thermal units, down from \$5.10 per MMBtu the previous month and from \$7.90 per MMBtu in the year-ago period.

The cost of LNG cargoes contracted in May in the spot market for future importation was \$4.10 per MMBtu compared with \$4.20 the previous month, according to the published government figures.

The numbers come from the commerce division of the Japanese Ministry of Economy, Trade and Industry and are only issued if a minimum number of two trades are recorded.

The ministry emphasizes that "spot LNG" refers to fuel traded

on a cargo-to-cargo basis and does not mean shipments under contracts on a short-term, medium-term or long-term basis.

Prices prior to averaging are all converted into an equivalent Delivered Ex-Ship (DES) basis whereby the seller carries the cost of the shipping.

As regards its overall imports, Japan said on May 23 in its trade figures that LNG shipments dropped 3.3 percent in April after edging higher the previous month.

The April deliveries of LNG to Japan amounted to 6.38 million tonnes compared with 6.59MT in April 2015, according to the trade statistics from the Ministry of Finance.

LNG imported by Japan for gas-fired fuel generation still fared

better than other generating fuels, with thermal coal imports down 16.3 percent to 7.56MT and oil shipments to Japan plunging 21 percent in April.

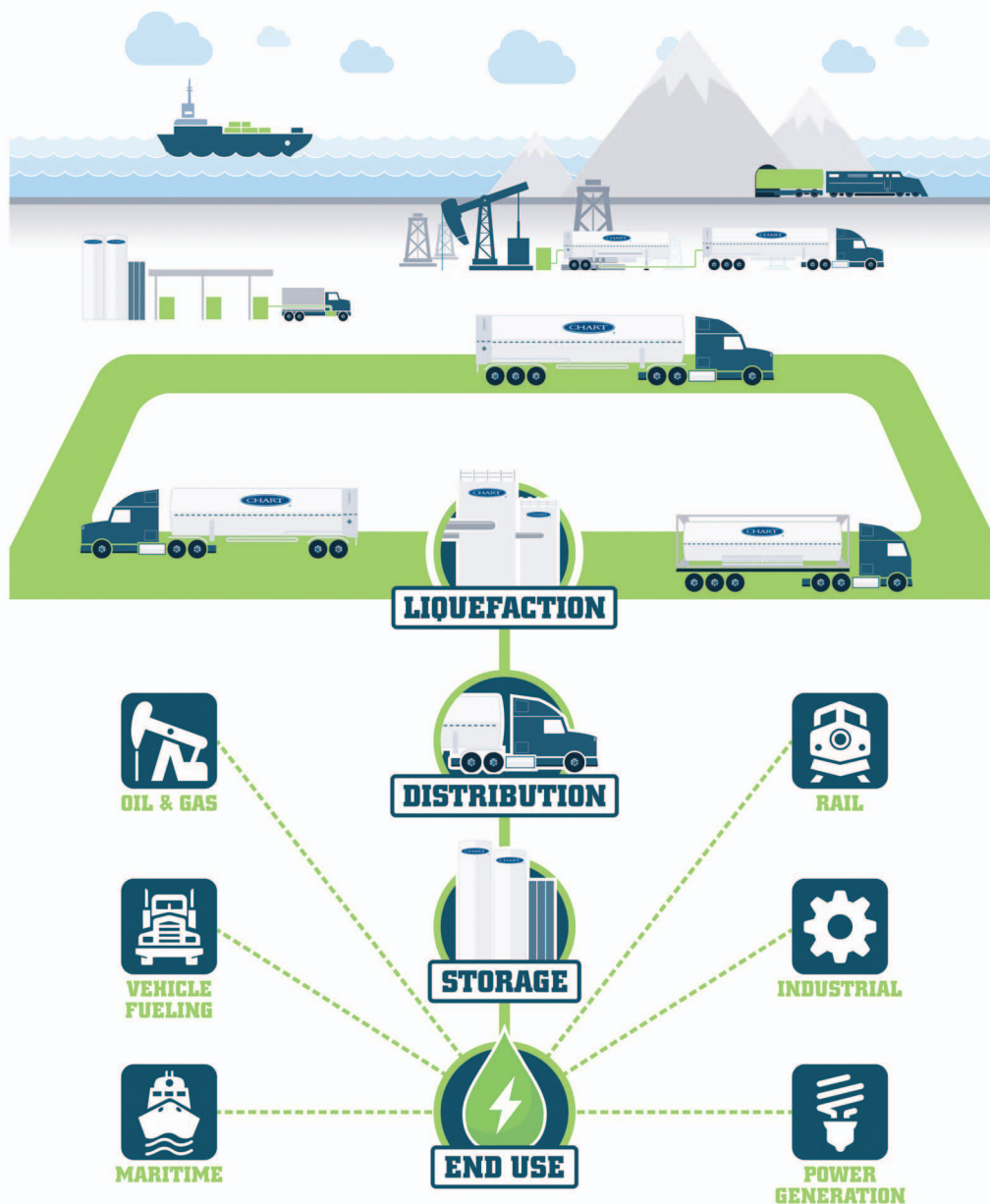
Japanese LNG imports had actually risen by a marginal amount in March 2016 for the first time since August 2015, to 8.14MT compared with 8.13MT in March last year, a rise of 0.1 percent.

The latest overall LNG import figures also illustrated the falling price of LNG with deliveries in April 2016 costing 232 billion yen (\$2.17Bn), down 44.5 percent, compared 417Bn yen (\$3.7Bn) in the year-ago period.

Fewer cargoes were imported from the Middle East while Asian imports rose 8.6 percent.



LNG VALUE CHAIN



www.ChartLNG.com

NEWS NUDGES

Inpex to explore offshore Japan

Japanese energy company Inpex Corp., the developer of the Ichthys LNG project in Australia and other ventures, said it was now planning to start drilling operations on an exploratory well offshore Japan. The drilling will take place off the coast of the prefectures of Shimane and Yamaguchi. The drilling operations are part of a project commissioned by the Agency of Natural Resources and Energy of the Ministry of Economy, Trade and Industry. "Inpex plans to determine the presence of hydrocarbon deposits in the area by conducting a detailed analysis and evaluation of data obtained through the exploratory drilling," the company said.

Russian gas market concern

Russian natural gas giant Gazprom has attacked regional governments for holding back its domestic market expansion that fell 5.5 percent last year to 221.2 billion cubic metres. "Russia's regional administrations' failure to perform their obligations to prepare consumers to receive gas and a growing consumer debt for gas delivered remain a drag on the rate of gasification in Russia," Gazprom said. "In 2015, only nine out of the 34 regions where Gazprom built inter-settlement pipelines had their authorities fulfilled their obligations in a timely manner," it added.

Philippines LNG visit

Energy World Corp., the Australian-listed developer of the first LNG import terminal and natural gas hub in the Philippines, has hosted a visit to the site in Pagbilao by officials from the Department of Energy and members of the nation's House of Representatives.

UK's Amec FW will build first onshore LNG terminal for India's east coast

Our Europe editor

Amec Foster Wheeler, the UK-based energy engineering and construction company, has won a contract to build the first Indian LNG import and regasification terminal planned for the east coast of the country at the port of Ennore in the state of Tamil Nadu.

The award followed the successful completion of a front-end engineering and design contract for the terminal in 2012.

Supervision

As part of the new contract, Amec Foster Wheeler's responsibilities include the supervision of works related to various engineering, procurement and construction contracts for the LNG regasification and marine import facilities, as well as the LNG storage tanks.

"Amec Foster Wheeler will also undertake project management consultancy activities for the entire project, from engineering development and construction phases, through to pre-commissioning, commissioning and start-up of the terminal," the UK company explained.

The developer of the Ennore



LNG terminal will be near Ennore in Tamil Nadu state

terminal is Indian Oil Corp., backed by the Tamil Nadu Industrial Development Corp.

The Ennore LNG project will have an expandable capacity of 5 million tonnes per annum and paves the way for supplies of natural gas to reach the southern and eastern states of India where demand is growing, particularly Tamil Nadu and some parts of Karnataka and Andhra Pradesh.

The facility will have two LNG storage tanks, each with capacity of 180,000 cubic metres. Amec FW said its contract will last 42 months and the completion date for the facility is around the end of 2018. While other Indian East Coast terminals are planned using Floating Storage and Regasification Units

(FSRUs), Ennore is the most advanced land-based venture.

All of India's current import terminals are land-based and located on the west coast, including three near Mumbai. They are Petronet LNG's terminal at Dahej, Royal Dutch Shell's facility at Hazira and the Dhabol terminal, controlled by Gas Authority of India.

There is also a fourth facility owned by Petronet and located at Kochi in the southwest state of Kerala.

The Ennore terminal, located north of Chennai (formerly known as Madras) is one of four being planned on the east coast, including two in the state of Andhra Pradesh.

Developer of two Louisiana projects recruits industry expert, bank founder

Venture Global LNG, a Washington DC-based company, said it had recruited one of North America's most experienced LNG executives as it advances with the development of two export plants in Louisiana, one at Plaquemines on the banks of the Mississippi River and a second near the Calcasieu Ship Channel.

VG LNG has named Terry Newendorp, the founder and former chairman of the investment bank Taylor-DeJongh, to its board of directors.

"Newendorp brings more than 30 years of expertise specific to LNG," the company said.

"He has served as the financial advisor for 27 trains of LNG pro-

duction, more than 77,000 megawatts of power generation and more than 26,000 kilometres of pipelines. Previous to the board appointment, Newendorp acted as an advisor to the company," VG LNG added.

The co-Chief Executives of the company, Mike Sabel and Bob Pender, said in a statement: "We are pleased to have a professional of such high caliber serving on our board. Mr. Newendorp's deep expertise in LNG project development and finance will add value to our company as we approach the final investment decision for our two LNG projects in Louisiana."

The VG Plaquemines project will be located on 630 acres near

river mile-marker 55 on the west side of the Mississippi, 30 miles south of New Orleans.

The Mississippi river project will produce 20 million tonnes per annum of LNG and will include 20 small-scale liquefaction Trains, four LNG storage tanks and three marine loading berths for ocean-going vessels.

VG is also planning to produce 10 MTPA of LNG at its Calcasieu Pass facility to be developed on a 1,000-acre site located at the intersection of the Calcasieu Ship Channel and the Gulf of Mexico.

The VG company was founded by Sabel, a banker by profession, and Pender, a lawyer.

Shell to curb new LNG investments as BG takeover saves more costs than expected

Our Europe editor

Royal Dutch Shell, the biggest global liquefied natural gas market player, said the takeover of LNG portfolio company BG Group is re-shaping the Anglo-Dutch oil and gas major and providing \$1 billion in additional savings, while the company's investments in new liquefaction projects would be slowing down.

Shell Chief Executive Ben van Beurden made these points and others in a speech to investors at a capital markets day where he provided an update on the company's strategy.

Integration

"The integration of BG is gathering pace, and today we expect to deliver more synergies, and at a faster rate," Van Beurden said.

In reference to the BG



Shell CEO Van Beurden outlined post-BG merger strategy

takeover, the Shell CEO said the company would slow its LNG investments and take advantage of the revenue flows.

"Integrated gas, which was previously a growth priority for Shell, has reached critical mass following the BG acquisition and planned growth in LNG, particularly in Australia. "The pace of

new investment will slow here and integrated gas will now prioritize the generation of free cash flow and returns," he stated.

He also announced an increase in expected deal-related synergies from the BG takeover from the \$3.5 billion set out in the prospectus, to \$4.5Bln on a pre-tax basis in 2018, an increase of some 30 percent.

After the takeover of BG the quarterly LNG sales of Shell rose to 12.29 million tonnes, putting the company on track for around 48MT of LNG sales for the whole of 2016 that will demonstrate its more dominant position in the market.

Shell's latest LNG sales volumes were 3MT more than the first-quarter 2015 volumes of 9.81MT. Its quarterly liquefaction volumes at various plants amounted to 7.04MT.

Van Beurden said the company's downstream and integrated gas businesses had still delivered strong results to underpin the financial performance despite continued low oil and gas prices.

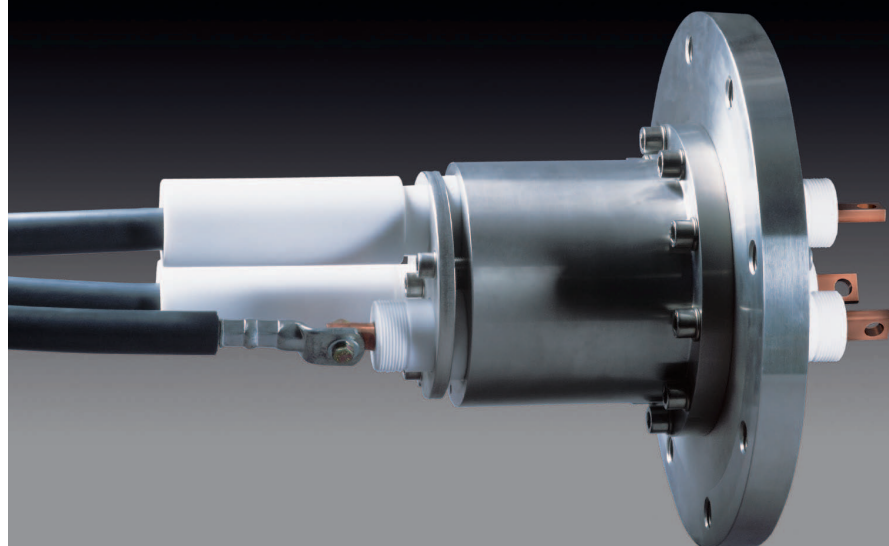
"We expect to achieve and exceed the \$3.5 billion (BG) synergies prospectus commitment earlier than expected, in 2017, when synergies should be \$4 billion.

SCHOTT Eternaloc® Terminal Headers

Small component – Big Impact.

Electrical terminal headers are small, yet safety-critical components of LNG vessels and terminals. They hermetically feed electricity and data to submerged LNG pumps, turbine expanders and compressors. At the same time their quality and reliability is critical to uphold the pressure vessel integrity and therefore the safety of the entire system. SCHOTT Eternaloc® terminal headers are the safest, most proven solution available in the market. **What's your next milestone?**

www.schott.com/lng



SCHOTT
glass made of ideas

Aker wins contract for Egypt's Med gas discovery

Aker Solutions of Norway has won an order to supply key equipment for the development of Egypt's largest offshore natural gas discovery being developed by Italian operator Eni as a gas hub for the East Mediterranean and ending the nation's need for LNG imports.

Aker said the Egyptian contract would see the delivery of its longest-ever umbilicals system for the Zohr gas field offshore the Egyptian city of Alexandria.

Umbilicals play an increasingly important role in offshore and subsea oil and gas developments. They contain electric cables and other connections to the surface to enable the development and control of subsea wells.

Aker said the agreement with Petrobel in Egypt was worth more than 1 billion Norwegian crowns (\$122 million).

Eni was given the go-ahead in February 2016 by the Egyptian Ministry of Petroleum and Mineral Resources to develop the Zohr field.

The Eni discovery will go some way to satisfying Egypt's domestic natural gas needs, while possibly helping to revitalize its two liquefied natural gas export plants.

The Egyptians stopped producing LNG three years ago as natural gas supplies were diverted by the state energy companies to satisfy pipeline high demand in the domestic market.

Even the existing gas resources were not sufficient and the Egyptians had begun importing LNG when Eni's Zohr discovery was made in August 2015.

The Aker contract involves the delivery of 180 kilometres of steel tube umbilicals that will connect the Zohr subsea development to an offshore control platform.

US regulator gives approval to Elba Island LNG export venture in Georgia

Our North America editor in New York

The US Elba Island liquefaction and export project near Savannah in Georgia has been fully authorized by the Federal Energy Regulatory Commission as one of only two major exporting ventures planned for the East Coast.

The FERC permit also authorized the Elba Express pipeline to add north-to-south transportation capacity to its existing pipeline to deliver feed-gas to the export plant.

Schedule

Owned by subsidiaries of Kinder Morgan, the largest US pipeline operator, the Elba Island export venture is scheduled to be on stream by the end of 2018.

"With the proposed mitigation measures and the recommended environmental conditions that are now included in this order, the Front-End Engineering and Design

includes acceptable layers of protection or safeguards to reduce the risk of a potentially hazardous scenario from developing into an event that could affect the off-site public," the FERC statement said.

"Based on the analysis in the Environmental Assessment, we conclude that if constructed and operated in accordance with the application and supplements, and in compliance with the environmental conditions, our approval of this proposal would not constitute a major federal action significantly affecting the quality of the human environment," the regulator stated.

The FERC approval of Elba Island is the second permit given to an East Coast venture. The Cove Point LNG project in Maryland, also an existing import terminal being transformed into an export plant, is already in the construction phase.

Several LNG export and fuel projects are proposed for the

state of Florida, though these are small-scale fuel market ventures.

The Elba liquefaction project, in which Royal Dutch Shell was previously a partner, will include the installation of 10 liquefaction units for an output capacity of around 2.5 million tonnes per annum of LNG and modifications to the terminal.

Under the current schedule, the Georgia liquefaction plant could be producing LNG by the start of 2018.

Kinder agreed in July, 2015, to buy Shell's 49 percent stake in the Elba Island terminal, leaving the pipeline company with 100 percent of the facility.

The transaction cost Kinder \$630 million, bringing its total investment in all the liquefaction and terminal facilities at Elba Island to about \$2.1 billion.

While Shell sold its stake in the terminal, the Anglo-Dutch company will remain as a customer.

Noble Energy of US given Israeli approval to develop huge Leviathan gas field

Noble Energy, the US company with natural gas assets and LNG plans offshore Israel, said the Israeli government has approved the development plan for the Leviathan project, the largest energy venture in the Eastern Mediterranean.

"The approved plan of development, contemplates a subsea system that connects production wells to a fixed platform located offshore with tie-in onshore in the northern part of Israel," Noble said.

The Leviathan field is operated by Noble and its partners include subsidiaries of Israel's Delek Group. It has estimated recoverable natural gas resources of around 22 trillion cubic feet.

The fixed offshore platform's initial capacity is anticipated to start at 1.2 billion cubic feet of natural gas per day and will be expandable to 2.1 Bcf/d.

"Leviathan is expected to pro-

vide a second source of supply and entry point into Israel's domestic natural gas transport system, while also delivering exports to regional countries," said Noble, referring to Egypt and Jordan.

Noble and its main partner Delek earlier announced the execution of a sales and purchase agreement to supply natural gas from the Leviathan field to Israeli company IPM Beer Tuvia Ltd.

"Noble and the Leviathan partners will supply a gross quantity of up to 473 billion cubic feet of natural gas to a new-build independent power facility over an 18-year term, or up to 72 million cubic feet per day (MMcf/d)," Noble added.

The price for the natural gas supplied to Israel is linked to the Public Utility Authority Index and includes a firm floor price.

However, Noble expects total gross revenues under the Israeli

contract to be in excess of \$2.5 billion.

"Receiving support from the Government of Israel for the plan of development further builds upon recent regulatory momentum, including the Natural Gas Regulatory Framework as well as the approval of the offshore location for the Leviathan platform and pipeline connection onshore," said J. Keith Elliott, Senior Vice President for Noble in the Eastern Mediterranean.

"Noble and partners have made quick progress marketing natural gas to new customers. Combined with a prior executed sales agreement, we have now contracted volumes from Leviathan to the Israel market in the amount of approximately 100 MMcf/d, with substantial volumes yet to contract in Israel and the region," he added.

DNV GL signs framework accord with the largest European LNG terminal near London

Our Europe editor

European maritime and project classification society DNV GL said it was awarded a framework agreement for the provision of design and engineering technical services to Europe's largest import terminal, Grain LNG, located near London.

DNV GL, the Norwegian-German class society that emerged from the takeover by Norway's Det Norske Veritas of Hamburg-based Germanischer Lloyd, said the scope of the three-year framework agreement covers feasibility studies, conceptual design studies, specialist engineering and risk management services up to and including front-end engineering and design.

River location

Grain LNG is located 45 miles southeast of London on the Medway River and is owned by National Grid plc.



Grain LNG is offering wider range of options to the market

It is the largest terminal in Europe and eighth largest in the world by tank capacity and occupies a site spanning more than 600 acres.

Grain LNG imports cargoes from nations such as Qatar, Algeria and Trinidad and has 1 million cubic metres capacity of storage.

It also offers truck-loading facilities for the UK's growth fuel and retail market.

"National Grid are working hard to develop Grain LNG as a

world leader," DNV GL said. "Over time, as indigenous supplies from the UK Continental Shelf diminish, LNG could make up a significant percentage of the UK's gas supply and demand requirement," it added.

According to Nicola Duffin, Commercial Manager of National Grid, "Grain recently celebrated 10 exceptional years of progress and now we are looking to the future, increasing the services we

offer to our customers and working to ensure that Grain remains the European port of choice for LNG shippers. DNV GL are crucial to our safety and success."

Hari Vamadevan, DNV GL Regional Manager UK & West Africa, said the Grain LNG award was a significant contract.

"The importance of LNG in the fuel mix is crucial to the UK, and the EU is supporting it as a clean fuel for road transportation," Vamadevan said.

"It is estimated that by 2020, 70 percent of the UK's gas will need to be imported and more importantly stored.

"National Grid are leading the way in their plans for Grain LNG and DNV GL is delighted to be involved in delivering success, on behalf of National Grid, to secure a better future for the provision of gas to homes and businesses throughout the UK," Vamadevan stated.

American Bureau of Shipping leads European venture for dry bulk carrier LNG fuel concept

The American Bureau of Shipping has joined forces with Greece's Arista Shipping, two companies from Finland and French storage tank technology firm GTT in a joint development project for a dry bulk carrier concept that uses liquefied natural gas as fuel.

The ABS partners from Finland are the design and engineering company Deltamarin and marine propulsion manufacturer Wartsila.

"The goal is to develop a Kamsarmax bulk carrier design to be the first of this type suitable for worldwide services powered by LNG," ABS said.

The LNG-fueled bulk carrier concept is one of the global joint ventures being showcased at the Posidonia International Shipping Exhibition taking place in Athens from June 6-10.

"This landmark design will be the first LNG-fueled cargo ship capable of full-range operations," the US class society said.

"The long-term potential for LNG as a marine fuel is tremendous," stated ABS Vice President of Global Gas Solutions Patrick Janssens.

"We see the near-term opportunities for larger vessels on fixed and known trade routes, but more opportunities will emerge as concepts mature and bunkering infrastructure expands.

"Environmental stewardship will continue to be a concern, and owners will be evaluating alternative fuel choices," Janssens added.

According to Arista Shipping senior executive Alexander P. Panagopoulos the bulk carrier

project will "bring the market a practical, achievable design for what are the workhorses of the shipping fleet."

Arista operates a small owned fleet and is also active in ship management.

"Our mission is to develop the next generation of energy efficient and environmental friendly dry bulk cargo ships to be sustainable worldwide beyond 2030," said Janssens.

"It marks a number of 'firsts' and draws together the experience of a team of leaders in their field to make LNG powered shipping a reality on the high seas," he added.

The companies' technical challenges in developing this design were considerable as there is a need to carry a large volume of LNG (2,500 cubic metres) to give a

full range of operations over 40 days. ABS said it would provide Approval in Principle for the concept, which is based on the Deltamarin B.Delta 82 design and using a GTT membrane LNG fuel tank.

"The concept also features a Wartsila four-stroke, medium-speed engine without auxiliary generators, the first time this configuration has been applied to a vessel of this type, significantly simplifying its engine room arrangement and contributing to lower capital expenditure," ABS added.

The Wartsila dual-fuel engine allows the use of either LNG or conventional marine fuel oils.

In gas-mode the engine is IMO Tier III compliant without the need for any exhaust cleaning systems.

Main European terminal operator Enagas advances plan to make Barcelona LNG hub

Our Europe editor

Enagas, the Spanish transmission network and liquefied natural gas terminal operator, is advancing in the development of new services, including bunkering plans for shipping to promote the wider use of LNG and recently signed an agreement with the Port of Barcelona.

Enagas Chief Executive Marcelino Oreja and the President of the Port of Barcelona in north-east Spain, Sixte Cambra, said the LNG initiative was centred on the import terminal, operated by Enagas, as well as the port area.

Hub format

The port authorities and Enagas are hoping to convert the Port of Barcelona into one of the LNG distribution hubs emerging in the Mediterranean area for marine



Barcelona LNG terminal was one of Europe's first in 1969

fuel and trucking. Enagas is one of the most experienced LNG operators in Europe and overseas.

The company owns joint venture stakes in two overseas LNG terminals at Altamira on the Gulf Coast of Mexico and at Quintero in Chile, as well as having the Spanish facilities at Barcelona, Cartagena, Huelva, Bilbao and El Musel.

"Both the Port of Barcelona and

Enagas are firmly committed to natural gas, which is currently internationally recognized and promoted as a fuel for the transportation of goods because it represents a truly sustainable alternative to conventional fuels derived from crude oil," the two companies said.

They noted that LNG was being increasingly used in shipping for tankers and land transportation of

trucks and that by the end of 2016 around 100 ships will be powered by LNG.

The Enagas storage and regasification plant in the Port of Barcelona has been in operation since 1969 and the operator has much accumulated experience and know-how regarding the handling of LNG.

"The availability of this plant constitutes a great opportunity to develop the process of changing the type of fuel used in the Port," they added.

Enagas CEO Oreja, highlighted the more than 45 years of experience that the company has in the natural gas sector and the important role that the regasification plant in Barcelona can play as a logistics centre, especially given the growing demand.

WE DO MORE.

You supply the energy that keeps the world in motion. We help you meet every challenge along the way.

Liquid Natural Gas (LNG) is gaining traction across the globe as a clean and efficient source of energy. Atlas Copco Gas and Process Division offers the cutting-edge equipment and quality service this dynamic market requires and helps you boost your performance and reliability on land and at sea.

www.atlascopco-gap.com

Atlas Copco