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Import terminals and more production offer regional LNG trading hub possibilities

South African FSRU plans may lead to first all-Africa LNG chain

Our Africa editor

An import facility currently being planned by South Africa could see cargoes being delivered soon from Nigeria or Angola, and eventually Mozambique, creating the first LNG chain in the Sub-Saharan region of the continent.

South African energy company PetroSA has contracted WorleyParsons to conduct both a feasibility study and front-end engineering and design for an LNG import facility in Mossel Bay, located east of Cape Town.

Reserves

PetroSA has been investigating the possibility of importing LNG to supplement dwindling natural gas reserves at the company's gas-to-liquids (GTL) refinery in Mossel Bay.

"The project has previously encountered various challenges, among them its commercial viability," the company said.

PetroSA's revised proposal involves the import of LNG into Mossel Bay through a floating regasification facility.

The terminal will have the addition of a breakwater and berth structure allowing a permanently moored Floating, Storage and Regasification Unit (FSRU) to discharge vaporised LNG into a subsea and an overland pipeline leading to the Mossel Bay refinery.

Producers

South Africa's move to join the nations importing LNG comes as its near-neighbour Angola begins



An LNG import facility at Mossel Bay would be the first in Sub-Saharan Africa, where LNG is set to be produced in Angola, while Mozambique, Tanzania and Kenya also have plans or possibilities for liquefaction

commercial exports of LNG cargoes from a new production facility at Soyo in the north of the southwest African country.

One of the world's longest-standing LNG producers is Nigeria, which has been sending cargoes out of West Africa since 1999.

Additionally, eastern neighbour Mozambique is poised to become one of the leading LNG exporters after 2018, following the discovery of huge natural gas reserves, opening the way for two world-class liquefaction projects in the country.

Kenya also has plans to develop an import terminal and there could be scope in several years for a southern African LNG trading hub, analysts said.

Economics

PetroSA said of its WorleyParsons contract award that the feasibility study would assess the technical and economic characteristics of various sites, "taking into account socio-environmental issues."

The FEED phase would then develop the designs for the preferred sites to a sufficient level of detail accurately to estimate the project costs and economics, and to make a final investment decision possible during the second

half of 2013. WorleyParsons is considered a world leader in the design and development of LNG import facilities, having completed more than 10 similar projects in various countries around the world.

Experts

"We have some of our best international experts working with our local South African project team to deliver a world-class design for PetroSA," said Greg Denton, Chief Executive of the Australian company's South African subsidiary, WorleyParsons RSA.

The Chief Executive of PetroSA, Nosizwe Nokwe-Macamo, said the establishment of an LNG facility in Mossel Bay was of critical importance for the sustainability of the company's GTL refinery.

The refinery was commissioned in 1992 as the world's first GTL facility and remains the third-largest in operation.

Using Fischer Tropsch technology, the refinery converts natural, methane-rich gas into ultra-clean, low-sulphur, low-aromatic synthetic fuels and high-value products.

It currently sources its feedstock from PetroSA's FA-EM and South Coast gas fields.

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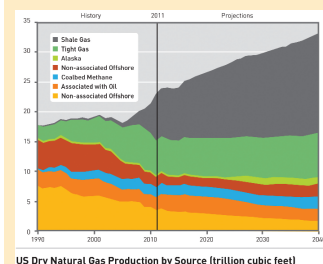
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Ex-Shell man Finlayson takes over at helm of BG from 'iconic' \$2-billion Sir Frank

New BG CEO has tough act to follow Sir Frank, who created a world-class LNG company out of a minor division of old British Gas after privatization

BG Group, the leading LNG portfolio player, appointed former Royal Dutch Shell executive Chris Finlayson as its Chief Executive to succeed Sir Frank Chapman, who is retiring, and has been lauded as an "iconic" industry figure.

Finlayson, who will formally take up his post on January 1, currently has executive responsibility for BG's exploration team, its major capital projects programme, contracts and procurement and technology. Before joining BG, he had been involved in the LNG business at a senior level in Nigeria and Russia.

Glowing

There was glowing praise for outgoing CEO Chapman, who turned a rump of the former nationalised British Gas into a dynamic LNG trading and shipping company with annual operating profit of over \$2 billion.

BG Chairman Andrew Gould stated: "Frank is an iconic Chief Executive who grew BG out of a minor division of the old British Gas into a vibrant international oil and gas major.

"He has delivered an amazing exploration track record, creating a huge resource base, and developed a differentiated and highly valuable LNG model.

"We owe him an enormous

debt of gratitude for what has been achieved and for the legacy of opportunities still to be realised," Gould said.

Veteran successor

Successor Finlayson has over 35 years' experience in the oil and gas industry and joined BG from Shell in August 2010 and was appointed to the BG Board in November 2011.

Finlayson currently heads the BG Advance division, including exploration, capital projects, contracts, and procurement and technology.

During his time at Shell, Finlayson was a senior executive in exploration and production, and held a number of senior positions in LNG in Russia, Nigeria and Brunei.

He was Managing Director of Shell Petroleum Development Co. of Nigeria and was also Shell's Director of Nigeria LNG, the second largest LNG plant in the world at the time.

As Executive Vice President Shell EP Russia, Finlayson was assigned to manage the cost and schedule issues at Sakhalin II, Shell's largest integrated oil and gas and LNG project at the time.

Candidates

Commenting on Finlayson's appointment Chairman Gould said:

"I am delighted to announce the appointment of Chris as BG Group's new Chief Executive. I have known Chris for many years and he has outstanding front line operating experience.

"The process to appoint Sir Frank's successor early in 2013 has been rigorous and comprehensive and allows for an orderly transition.

"The board identified and assessed three internal candidates and a number of external candidates. It was a tough competition but reached a clear conclusion. We were unanimous that Chris has the right skills for the next stage of BG's evolution, and the delivery of our growth projects," Gould added.

Mission

Commenting on his selection as the new CEO of BG, Finlayson said: "My priority is to build on this legacy by delivering the new growth projects that will commercialise this huge and valuable resource base, to continue to build on our exploration success, and at the same time to drive for operational excellence and cost efficiency."

Chapman will step down from the Board and Group Executive Committee on December 31, 2012, and will, as planned, continue to work as an advisor in support of the CEO's transition until his retirement in June 2013.

He also has health issues.

"In June this year, Sir Frank began a course of medication for very early stage myeloma. He has experienced no symptoms from the condition, or side effects from the treatment. He remains fit and well and has continued to fulfil his duties as Chief Executive with the full support of the Board," BG said.

"The course of medication has been very effective in dealing with Sir Frank's condition and in 2013 he will undergo 3 to 4 weeks



Chris Finlayson takes over from Sir Frank from January 1

hospital treatment to consolidate the excellent progress made," the company added. Commenting on the transition, Chapman said: "I am delighted that Chris has been asked to succeed me.

"His depth of knowledge and wealth of international experience is perfectly matched for the delivery task that lies ahead. I wish him every success," Chapman said.

"For me the last 16 years has been a fascinating and totally absorbing journey. The greatest reward has come from working with so many talented and committed BG people. Who they are and how they go about their work defines BG and I thank every one of them for their loyalty and hard work," Chapman added.

Background

Chairman Gould added: "We will hold a Q4 and full year results update on 5 February 2013. As a consequence of the Chief Executive transition, the Group's strategy update will now be held later in the year."

Finlayson graduated First Class Honours BSc Physics and Geology from University of Manchester in 1977.

During his time at Shell in Nigeria he was responsible for some 6,000 staff and 22,000 contractors, managing production of some one million barrels of oil equivalent per day, and brought on stream Shell's first offshore Nigeria floating production. He also took the Bonga FPSO through construction and brought it on stream.



Outgoing BG CEO Sir Frank with TV personality Professor Brian Cox at a conference. Sir Frank will act as an advisor to BG until June 2013

Shell and Technip-Samsung plan multiple FLNG plants

An agreement boosts design, engineering and construction for liquefaction hulls at the Goeje shipyard

Royal Dutch Shell and a consortium made up of France-based engineering company Technip and Samsung Heavy Industries signed an agreement opening the way for multiple Floating LNG production plants to be built in South Korea.

The heads of agreement is aimed at enhancing collaboration on the design, engineering, procurement and construction of the facilities, with Samsung "ready to construct multiple FLNG" hulls at its Goeje shipyard.

Prelude

Shell and Technip-Samsung are already working together on the Prelude FLNG, which will be moored 200 kilometres off the Northwest coast of Australia in the Browse Basin.

"As their experience grows, Shell and TSC perceive that there are many opportunities ahead," the companies said.

FLNG plants open the way for faster and more flexible development strategies for stranded gas fields previously regarded as uneconomic, or constrained by technical or other risks.

"The agreement builds on the existing relationship, formed in 2009, to ensure the parties can capitalize on insights gleaned from the design and construction of Shell's Prelude FLNG facility and expand the technology offering to the energy market.

"It will drive a culture of joint delivery, continuous improvement and ensure greater value from the

collaboration for all parties," the three companies said.

Thierry Pilenko, Chairman and Chief Executive of Technip, said: "Shell's FLNG vision and ambition is gaining momentum and Technip, with its partner Samsung Heavy Industries, is proud to support the additional projects that could be realized under this agreement.

"Technip has always been a pioneering company, and today we reach another milestone in this fantastic journey, truly supported by the commitment and the passion of all our people," Pilenko stated.

Dae Young Park, President and Chief Executive of SHI said: "This heads of agreement will enable Samsung, together with partners, Shell and Technip, to further strengthen its reputation as a definite leader in the floating LNG business with the successful completion of FLNG projects to come.

Delivery

"As CEO of SHI, I am very confident that Samsung is ready to construct multiple FLNGs at its Goeje shipyard and is fully committed to achieving the highest quality and on-time delivery of Shell's FLNG facilities in accordance with the spirit of the partnership," the SHI chief said.

According to Matthias Bichsel, Director of Shell Projects and Technology, Shell and the Technip-Samsung consortium "are forging a strong alliance to help ensure we are well positioned to deliver innovative FLNG solutions across a



Old world setting for newest LNG technology. Shell and the Technip-Samsung consortium signed a long-term Floating LNG agreement. Pictured from left: Dae Young Park, President and CEO of SHI; Thierry Pilenko, Chairman and CEO of Technip; Neil Gilmour of Shell FLNG; and Matthias Bichsel, Director of Shell Projects and Technology

wide range of opportunities."

"Central to this portfolio expansion are technology designs that cater for a wider range of gas fields. In locations where liquid production is low, for example, Shell's FLNG lean technology would be able to process additional gas and produce more LNG, opening up new business opportunities for countries looking to develop their gas resources," Bichsel said.

Shell expects global natural gas demand to increase by about 60 percent to 2030, reaching 25 percent of the global primary energy mix and within that, strong growth in LNG.

Offshore deal

Shell's Global Solutions unit last month awarded Technip a framework agreement for offshore facilities in a region covering Asia and Australia.

That contract is for a period of

five years, with an additional five-year extension option.

Paris-based Technip is currently building up all facets of FLNG and subsea capabilities.

Shell for its part is planning to develop other FLNG projects in the region, including the Abadi FLNG venture led by Japan's Inpex offshore Indonesia.

The separate Technip-Shell contract concerns engineering and project management services to support the engineering scope of Shell's offshore project facilities in the Asia-Pacific.

Technip's scope of work includes pre-front-end engineering and design as well as FEED, procurement services and construction management.

Technip's operating centre in Kuala Lumpur, Malaysia, will execute the Shell offshore contract with the support of other operating centres in the Asia-Pacific region. ■

Teekay orders more LNG carriers for new wave of output

Teekay LNG Partners signed an agreement with Daewoo Shipbuilding and Marine Engineering of South Korea for the construction of two 173,400 cubic metres capacity LNG carriers, and with an option for three more, to prepare for the next wave of LNG output and shipping US-produced cargoes through the Panama Canal.

Teekay LNG, a Bermuda-based subsidiary of Canadian shipping line Teekay Corp., said it intended to secure long-term contracts for both firm vessels prior to

their delivery in the first half of 2016.

The newbuilds will be constructed with M-type, electronically-controlled, gas-injection (MEGI) twin engines, which are expected to be significantly more fuel-efficient and have lower emission levels than other propulsion currently used in LNG shipping, Teekay said.

Teekay currently has one-third to 100 percent shares in 27 LNG carriers, including several contracted for deliveries from Qatar, the world's largest producer.

Earlier this year, Teekay also acquired a 52 percent interest in six LNG carriers in a deal with Japan's Marubeni after AP Moller-Maersk sold its fleet.

It also acquired in 2012 a 33 percent interest in four Angolan LNG project carriers from parent Teekay Corp.

The newbuild contract with DSME "includes a favorable instalment payment schedule, with the majority of the purchase price due upon delivery," Teekay said. ■

NEWS NUDGES

Talks for Eni CEO

Eni Chief Executive Paulo Scaroni and the President of Mozambique, Armando Guebuza, held talks in the Mozambican capital, Maputo, centred on the Italian energy company's planned LNG project in the southeast African nation. "Among the issues discussed were the future monetization of the gas resources via development of LNG export facilities, and the supply of gas for domestic power generation," Eni said.

Tokyo Gas sales rise 17 percent

Tokyo Gas, Japan's second-largest LNG importer, said sales of natural gas to customers increased by an average of 17 percent in all sectors in November compared with the same month a year ago. Sales amounted to about 1.15 billion cubic metres of natural gas, equivalent to 940,000 tonnes of LNG.

Angola LNG plant start set for 2013

The Angola LNG production plant in southwest Africa is now scheduled to ship commercial cargoes from the first quarter of 2013 after technical delays. The majority shareholders are Chevron and state energy company Sonangol, while Total, BP and Italy's Eni also hold stakes.

Qatar cargo for Belgium on Jan 1

The 145,000 cubic metres carrier "Ejnan" is scheduled to deliver a cargo from Qatar to the Fluxys-operated Zeebrugge import terminal in Belgium on January 1, according to port data.

Chinese build up Australian presence as PetroChina gets Browse LNG stake

BHP Billiton, the Australian commodities and energy company, has agreed to sell its stake of about 15 percent in the Browse LNG project in Western Australia to PetroChina for US\$1.63 billion.

The Australian company said other participants in the Browse joint venture had the right to match the offer and the transaction with the Chinese state-run company would require regulatory approval.

Interests

PetroChina now has interest in three LNG projects in Australia, while China National Offshore Oil Corp. and Sinopec also have stakes in two ventures, with BG Group of the UK and ConocoPhillips respectively.

BHP said completion of the PetroChina transaction was expected in 2013. The Browse LNG project is led by Australia's largest LNG producer Woodside Petroleum, operator of the current North West Shelf and Pluto LNG plants in Western Australia.

The partners in Browse LNG have secured land for an LNG plant at James Price Point near the town of Broome in cooperation with the government.

Though Browse LNG is still far from making a final investment

decision for the multi-Train project, its cost would likely exceed \$30 billion.

BHP's Chief Executive of Petroleum, J. Michael Yeager, said: "This is an excellent opportunity for both companies. PetroChina has acquired an interest in a world-class gas resource and BHP Billiton has exited a non-strategic asset."

CSG-to-LNG

PetroChina is also involved in two coal-seam-gas-to-LNG projects in Queensland, one called Arrow LNG and in partnership with Royal Dutch Shell. It also has a stake through a subsidiary in the Fisher's Landing CSG-to-LNG project in partnership with small Australian developer, LNG Ltd.

The Browse LNG joint venture has received final state environmental approval, though it still requires a permit from the federal government.

In addition to Woodside and BHP, Browse LNG includes Chevron, Shell, BP and Japanese trading companies Mitsui and Mitsubishi.

Woodside brought Mitsui and Mitsubishi into the Browse venture earlier this year by selling the companies part of its stake for \$2Bln.

It had to be approved by the Australian Foreign Investment

Review Board and the other shareholders had pre-emption rights, as is the case with the BHP-PetroChina deal.

Analysts said other shareholders were likely to welcome PetroChina on board, as was the case with the Japanese investors, with the Chinese company able to pay its share of the rising costs of LNG projects and to be a possible buyer of LNG cargoes under contract.

Three Trains

The three planned Browse processing Trains will have a capacity to produce 12 million tonnes per annum of LNG.

Even after its stake sale to the Japanese partners, Woodside retained about 31.3 percent of the Browse project.

That sale was completed in September 2012 and involved Mitsui and Mitsubishi taking a 16 percent interest in the East Browse joint venture and 8 percent interest in the West Browse joint venture, giving them a combined 14.7 percent interest in the Browse LNG project.

BHP is selling PetroChina its 8.33 per cent interest in the East Browse portion and its 20 per cent stake in the West Browse development, also amounting to about 15 percent of the overall project. ■

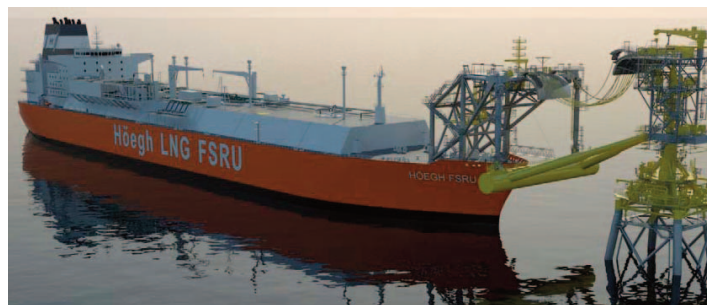
Modec wins mooring system contract from Hoegh LNG for Indonesia import project

Modec Inc., the Japanese energy production and platforms company, said its mooring system was chosen by Hoegh LNG of Norway for a Floating Storage and Regasification Unit offshore Lampung in Indonesia.

The Tower Yoke Mooring System was developed by Modec subsidiary Sofec Inc.

"The Tower Yoke will provide a permanent mooring for the FSRU, 20km offshore, southeast Sumatra, in a water depth of 23 metres," Modec said.

The system includes a swivel stack assembly and riser piping to transport gas through a single 24-inch line. LNG carriers will moor for



Modec unit Sofec will supply mooring system (above) to Hoegh FSRU

side-by-side offloading to the FSRU.

In addition to the local weather conditions the system will also be designed to withstand earthquakes under the supervision of Norwegian classification society Det Norske Veritas.

"Hoegh LNG has established a strong presence in South-East Asia and Sofec was pleased to offer their support on this project, and looks forward to working with Hoegh on further projects as the opportunities arise," the company said. ■

Qatari Bank forecasts big decline soon in Gulf LNG spot cargo offerings

As more contracts come into force the world's largest producer will see incremental portfolio fall

Qatar National Bank said the Gulf state's two production companies, Qatargas and RasGas, would reduce their spot market sales by at least 40 percent by 2014, curbing supplies available for Europe.

The state bank said Qatar's LNG boom has been "phenomenal" since exports began in 1996, but spot cargo sales were set to fall as more contracts came into force, such as last week's signed with Thailand state energy company PTT for 2 million tonnes per annum over 20 years from 2015.

Surge

Qatar was the world's largest exporter by 2006 and in 2011 it exported 76 million tonnes of LNG, accounting for 31 percent of the global market. The next largest exporter was Malaysia with 24 million tonnes, less than one-third of the tonnage.

Most of Qatar's production goes towards meeting the long-term commitments of Sale and Purchase Agreements (SPAs).

In 2012, Qatar had SPAs for around 55 MT, or 73 percent of its production.

By 2014, SPA export commitments will increase to 64MT, or 84 percent of total output at the Ras Laffan complex.

Destinations

"These new contracts are mainly to Asia Pacific and South America, meaning that Europe's share of

Qatar LNG exports is likely to fall," the bank said.

In the period from 2014-21, around 16 percent of production is not covered by existing SPAs and is potentially available to be sold on spot markets.

"Spot volumes available for sale will drop to about 27 percent of total output this year from 28 percent, and to 16 percent by 2014 as long-term supply agreements go into effect and new ones are signed," QNB said.

It is likely that over time, new contracts will be signed to replace or extend existing contracts as their terms expire, the bank added.

A number of potential SPAs are currently under discussion after the Thailand SPA, reportedly with India, Pakistan and Turkey.

Proportion

According to QNB, this should keep the proportion of production sold on spot markets at around 16 percent "or even lower."

Last year 47 percent of Qatar's LNG exports went to the Asia Pacific region and 42 percent to Europe.

"Asia has been the primary export destination for some time, and received an even larger share in 2011 of 79 percent," QNB said in its review of the nation's LNG industry and future strategy.

"This region is characterised by a shortage of hydrocarbon

resources combined with rapidly rising demand for gas-fired power generation.

"The largest Asian destinations for Qatari LNG were Japan (12MT), India (10MT) and South Korea (8 MT)," it said.

Europe

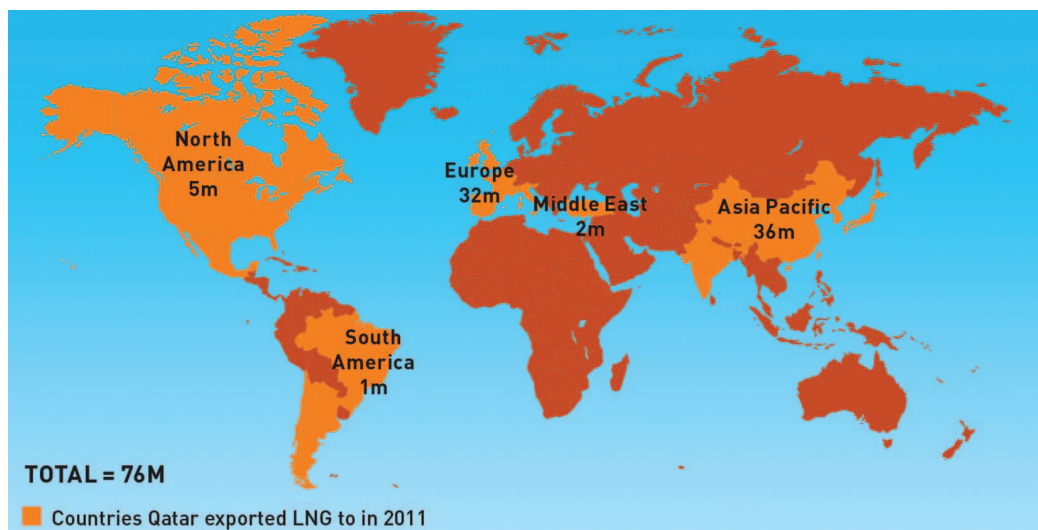
Europe's share of Qatar's LNG exports has increased significantly, mainly as the UK has had to replace declining gas production from its North Sea fields.

"The UK was the single largest importer of Qatari LNG in 2011. It has long-term SPAs with Qatar for a total of 1MT per year and in 2011 purchased a further 4MT of Qatari LNG on the spot market," QNB said.

"Other countries in Europe have also increased imports from Qatar to lower dependence on Russian supplies, and to reduce carbon emissions by using more, relatively clean, natural gas," it added.

"Notably, this has led to increasing exports to Italy (6.1MT in 2011), Spain (4.8MT) and France (3.2MT). Belgium imported 6.1MT in 2011, up from 2.8MT in 2007, some of which was re-exported through recently-expanded storage facilities at Zeebrugge port, designed to support the development of an LNG spot market," the bank said.

According to QNB, Qatar is gradually diversifying its LNG export destinations.



Supplier to the world: The geographic spread of the most recent annual export volumes of Qatargas and RasGas

In 2007, Qatar exported to eight different countries and in 2011 it exported to 23 different countries.

In 2011, export destinations included the Middle East (UAE and Kuwait) and South America (Argentina, Brazil and Chile).

Exports to Argentina are set to rise after the signing of an SPA for 5MT per annum starting in 2014. Qatar will also soon make its first delivery of LNG to Singapore in the first quarter of 2013.

Jordan

Jordan has expressed strong interest in importing LNG, and Qatar is helping it to build a regasification terminal in Aqaba.

In 2011, there was a rapid increase in the amount of Qatari LNG exports sold on the spot market to around 28 percent of production, up from 9 percent in 2010.

"This was owing to a combination of rising production in Qatar and a redirection of exports away from the US (as its domestic gas supplies increased sharply) towards the spot market.

"This was positive for Qatar as spot market prices remained high and demand was robust. Demand from Japan was particularly strong as the country shut down its nuclear power plants in the aftermath of a tsunami and needed more LNG as an alternative power source" the bank said.

Sempra now aims to start construction of Cameron LNG export plant by end of 2013 as FERC process gets underway

The California utility's project has Mitsubishi, Mitsui and GDF-Suez as investors

Sempra Energy, the California-based US utility and LNG player, has filed its permit application to the Federal Energy Regulatory Commission for the Cameron LNG liquefaction plant planned for Hackberry, Louisiana, on the site of an existing import terminal.

"The project has been progressing successfully through the FERC pre-filing process, which was initiated in April," said Sempra.

Target

The company was now seeking permission to begin construction by the end of 2013.

Earlier in 2012, Cameron LNG signed commercial development agreements for Cameron LNG with Japan's Mitsubishi Corp. and Mitsui & Co., as well as with France's GDF-Suez.

These commercial development agreements bind the parties to fund all development expenses, including design, permitting and engineering for the full capacity of the new facility.

"The Cameron liquefaction project represents a significant investment in new energy infrastructure in Louisiana that will stimulate local, regional and national economic activity, creating new jobs and supporting small businesses," said Mark A. Snell,

who is President of Sempra Energy.

Schedule

"Our filing keeps us on schedule to receive FERC approval and begin construction in the fourth quarter of 2013," he added.

"The net benefits of the project outlined in the FERC application include creating nearly 3,000 direct jobs in the peak construction year and approximately 130

"The public scoping meetings held during the summer demonstrated strong community support for the proposed project," said Octavio M. C. Simoes, President of Sempra Energy's LNG operations.

Positives

"Our project stimulates the economy, creates local wetlands, promotes stability in domestic natural gas pricing and increases global

benefits to the US economy.

The third-party study, prepared by NERA Economic Consulting, is expected to help the DoE weigh some 15 proposals for LNG export, including Sempra's.

Cameron LNG already has received approval from the DoE to export LNG to countries with which the US has qualifying free-trade agreements.

"The company's application to export to non-free-trade agreement countries, filed in December 2011, is expected to be among the first to be considered early next year," Sempra said.

In place

The liquefaction plant will use Cameron LNG's existing facilities, including two marine berths capable of accommodating Q-Flex-sized LNG ships.

There are also three LNG storage tanks of 480,000 cubic metres, and vaporization capability for regasification services of 1.5 billion cubic feet per day.

The new liquefaction facility will be comprised of three production Trains with a total export capability of 12 million tonnes per annum of LNG.

The facility is expected to begin delivering LNG to international markets in 2017. ■



The Cameron LNG import terminal in Hackberry, Louisiana, will be transformed into a liquefaction plant, with development costs coming from Japan and Europe after supply deals with three companies

full-time jobs when fully operational," Sempra stated.

The FERC will review the application and conduct an environmental study of the project prior to acting on the permit.

economic trade," Simoes said.

Sempra pointed out that a report for the US Department of Energy released in early December demonstrated that increased LNG exports will result in net economic

Ophir of UK confirms Tanzania LNG project ambition after new tests

Ophir Energy Chief Executive Nick Cooper said the appraisal programme for the UK explorer's Jodari natural gas field offshore Tanzania underlined its potential to anchor the East African nation's first multi-Train LNG development.

London-listed Ophir, the fifth-largest deepwater acreage holder offshore Africa and a FTSE 250 company, made the statement in announcing the latest successful results of its three-well appraisal programme on the Jodari field, Block 1 Tanzania.

Ophir holds 40 percent of Blocks 1, 3 and 4 and the world's leading LNG portfolio player, BG Group of the UK, operates the licence with 60 percent.

The Ophir-BG joint venture said the three wells were drilled into the discovery: Jodari South-1, Jodari South ST-1 (a deviated side-track) and Jodari North-1.

The drilling reconfirmed the 3 trillion cubic feet to 4 Tcf mean recoverable resource estimate and "demonstrated consistent, high-quality reservoir quality across the Jodari field," Ophir said.

BG Chief Executive Frank Chapman said earlier this year that he was contemplating a possible LNG production plant in East Africa using feed-gas from its exploration and production assets offshore Tanzania and Kenya.

With huge discoveries offshore Mozambique in southeast Africa, and two separate

LNG projects being planned there by Anadarko of the US and Italian energy company Eni, the region is set to become the new LNG province of post-2020.

The Ophir drilling also confirmed "the feasibility of high-angle (sub-horizontal) drilling thereby reducing development costs," the UK company added.

Jodari South-1 was drilled 3.5 kilometres southwest of the Jodari-1 discovery well in 1,040 metres of water to a total depth of 3,441m and was designed to evaluate the southern end of the Jodari field.

The well was side-tracked to drill Jodari South ST-1 and drilled to 3,282m as a high angle (sub-horizontal) well into the reservoir. ■

Germany comes up with tax-free solution ahead of new fuel emission control rules

Shipping industry is given boost by Berlin move to keep costs down in fuel switch

Shipping companies in Germany will be able to purchase LNG fuel tax-free under a new measure the government is introducing to support the new cleaner ports policy being brought into force in Europe and elsewhere in the next few years.

A Sulphur Emission Control Area comes into force in Northwest Europe in 2015 when stricter rules are imposed governing sulphur in maritime fuel.

Politician

Eckhardt Rehberg, who is responsible for maritime issues in the parliamentary group of Germany's CDU and CSU, said that the LNG tax exemption was linked to the recently adopted energy and electricity tax act.

"LNG is more environmentally friendly as it emits significantly less nitrogen oxide and sulphur compared with the traditional heavy oils," Rehberg said.

"In addition, Germany wants to act ahead of time and would have to face a competitive disadvantage if other member states of the European Union introduced tax exemptions on LNG first," he said.

"LNG is increasingly being used in the shipping industry as a fuel," he said. "This is good for our environment," he said.

Deadline

"In January 2015 stricter requirements for emissions in ports come into force, and this will present shipping with a new challenge," Rehberg explained.

"By taking away this burden, we give shipowners their cash flow - and we strengthen Germany," he stated.

It is anticipated that within the next years a considerable portion of shipping will be LNG-fuelled, particularly in the short-sea sector



Brunsbüttel Port (above) in Germany, at the junction of the River Elbe and the Kiel Canal, is one of the growing number in Northwest Europe setting up LNG bunkering as its use grows for maritime propulsion

and in Emission Control Areas.

In addition to moves by governments to encourage maritime LNG use, Europe's largest ports, including Rotterdam and Gothenburg in Sweden, have entered alliances to speed up the adoption of more LNG.

Ports aim to have infrastructure for LNG bunkering available once the sulphur regulations come into effect.

Benefits

LNG offers substantial environmental benefits. Sulphur and particle emissions can be reduced to almost zero, nitrogen oxide emissions by 85-90 per cent and net greenhouse gases by 15-20 per cent, according to maritime fuel experts.

The decision to adopt LNG rests primarily on the price difference between LNG and heavy fuel oil.

And there are indications that ship operators may receive LNG at the price of heavy fuel oil in Europe today if they negotiate well.

Owners will look at the costs of investment accurately to assess whether a decision to implement

LNG on a vessel makes sense. The German tax-break will help.

The price difference between heavy fuel oil and LNG and the amount of time a vessel operates in ECA zones are the most significant factors in determining the payback time for the investment in LNG before 2020.

More zones

The establishment of more ECAs could also act as a spur to LNG adoption. Deep-sea vessels will typically spend five to six per cent of their operating time in ECAs, according to studies.

In addition, a number of other sea areas are expected to introduce similar restrictions on emissions before 2020, the effective date of the global sulphur limits on heavy fuel oil.

Gasnor of Norway has plans to make LNG available in the German port of Brunsbüttel. The company plans to supply the LNG by truck initially, and possibly build a small terminal in the future provided that demand develops accordingly.

Such announcements from the supply industry are necessary to encourage ship owners to consider using LNG. ■

NEWS NUDGES

Peru LNG cargo heads for Japan

Peru LNG has loaded a cargo on board the 153,000 cubic metres capacity carrier "STX Frontier" and destined for Japan. One earlier December cargo was sent to the Manzanillo import terminal in Mexico, according to data from PeruPetro.

New LNG player PTT raises \$3Bln

PTT Exploration and Production of Thailand, the newest upstream LNG player, was selling \$3 billion worth of shares to fund expansion, including its future investments in the Mozambique LNG project being developed by Anadarko Petroleum of the US. The Thai company acquired its 8.5 percent stake in Anadarko's LNG project for \$2.2Bln when it trumped Shell in a takeover battle for Cove Energy of the UK.

More Qatari LNG for South Hook

The 266,000 cubic metres capacity Qatari Q-Max LNG carrier the "Al Mayeda" is scheduled to deliver a cargo to the UK South Hook LNG import terminal in Milford Haven, Wales, on December 19, port authorities said.

Small-scale LNG move in Alaska

The Alaskan state government will finance a small-scale liquefaction project to the tune of \$355 million on the North Slope to support an LNG trucking operation, regasification facilities and natural gas distribution around Fairbanks in Alaska.

US government energy forecasters give Henry Hub makeover and take LNG exports more into account with new methodology

The benchmark price in Louisiana is seen by East Asian LNG buyers as providing a gateway to less expensive cargoes. But the US is altering its way of assessing for purely domestic reasons

The US benchmark Henry Hub price has been given a makeover by the US Energy Department in relation to its price forecasts, while oil price projections have moved to the best indicator of East Asian LNG prices, Brent crude oil.

In a prelude to its 2013 Energy Outlook, the US Energy Information Administration, said it was projecting the benchmark Henry Hub spot price using a new methodology. The full EIA Outlook for 2013 is published early in the second quarter of 2013.

Wellhead

Previously, the Henry Hub prices as forecast by the EIA were based on the average national wellhead price and its historical relationship with the Henry Hub price.

The benchmark US price has taken on additional significance because of tolling agreement deals that will be part of the US LNG export business.

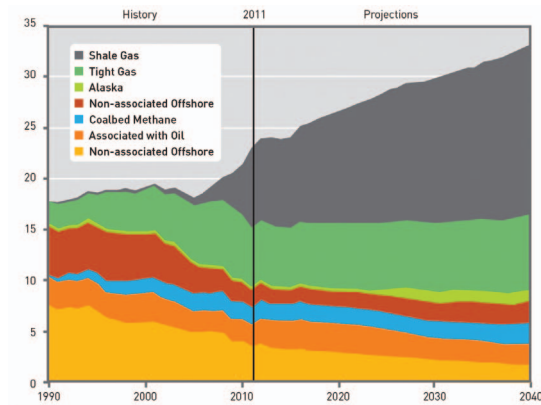
The Henry Hub price is also seen by East Asian buyers as providing a possibility of less expensive LNG cargoes.

"Given historical correlations, the projected difference between the Henry Hub price and the national average wellhead price increased as the wellhead price rose over the projection period," the EIA said.

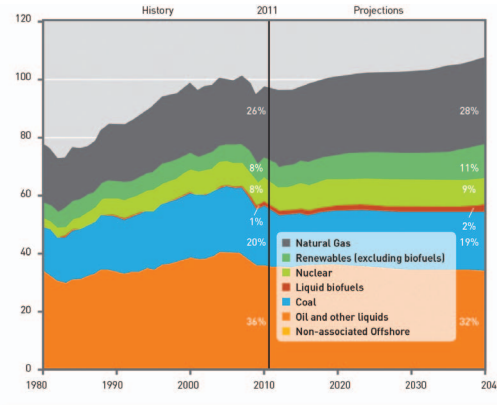
Now the Henry Hub spot prices in the 2013 EIA outlook reference cases are based on natural gas prices that balance the supply and demand for US Gulf Coast natural gas, which contributes to a lower Henry Hub price projection in 2013 compared with 2012.

The Henry Hub is a natural gas pipeline located in Erath, on the Gulf coast of Louisiana, that serves as the official delivery location for futures contracts on the New York Mercantile Exchange.

Henry Hub is owned by Sabine Pipe Line and has access to many



US Dry Natural Gas Production by Source (trillion cubic feet)



US Primary Energy Consumption by Fuel (quadrillion Btu per year)

of the major natural gas markets in the US through other major pipelines.

The important hub connects four intrastate and nine interstate pipelines within the southern states of the US.

Among its other innovations is that North Sea Brent crude will be the EIA's benchmark for oil as the US becomes a bigger supplier to the world markets.

The Brent spot price is also closer to the Japanese Crude Cocktail as an indicator of East Asian LNG prices.

Crude cocktail

The EIA has dropped its domestic US oil benchmark, saying it no longer reflected the price paid for oil by US refineries.

It is therefore abandoning West Texas Intermediate (WTI), traded on the New York Mercantile Exchange, and switching to Brent on the InterContinental Exchange.

The move by the US Department of Energy's energy forecasters reflects a migration of large parts of the oil market to Brent and away from WTI over the last year.

The EIA is also including a North Slope LNG export project in the reference case of its annual forecast of domestic energy markets.

After keeping an Alaska natural gas pipeline out of the reference

case for the past two years, the EIA included a revised version of the project in the reference case of its preliminary outlook.

Alaskan LNG

Despite looking five years further into the future than the 2011 and 2012 outlooks, the newest reference case still excludes an Alaska natural gas pipeline into the Lower 48 "because assumed high capital costs and low natural gas prices in the lower 48 states make it uneconomical to proceed with the pipeline project over the projection period."

But the 2013 reference case includes an Alaska LNG export project coming on stream around 2023 and contributing to a near quadrupling of domestic LNG exports by 2040.

While the 2012 outlook offered projections on the domestic energy landscape through 2035, the 2013 addition extends the outlook to 2040.

Increased production would make the US a net exporter of natural gas, improving the economics of an Alaska LNG project.

Liquefaction

In the reference case, the EIA expected the US to export 600 million cubic feet of natural gas per day in the form of LNG by 2016, increasing to 4.5 billion cubic feet per day by 2027, as export vol-

umes peak from facilities on the Gulf Coast and in Alaska.

After two competing projects to build a gas pipeline from the North Slope into the Lower 48 failed to yield sufficient shipper commitments last year, Alaska Governor Sean Parnell challenged the industry to focus on a project to export North Slope natural gas to East Asia, as LNG.

Here are the EIA's preliminary forecasts: (The full outlook will be published by the second quarter of 2013.)

"With increasing natural gas production, reflecting continued success in tapping the nation's extensive shale gas resource, Henry Hub spot natural gas prices remain below \$4 per million British thermal units (in 2011 dollar terms) through 2018 in the 2013 projections.

"After 2018, natural gas prices increase steadily as tight-gas and shale-gas drilling activity expands to meet growing domestic demand for natural gas and offsets declines in natural gas production from other sources.

"Natural gas prices rise as lower cost resources are depleted and production gradually shifts to less productive and more expensive resources. Henry Hub spot natural gas prices (in 2011 dollars) reach \$5.40 per MMBtu in 2030 and \$7.83 per MMBtu in 2040," the EIA stated.