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May 2016

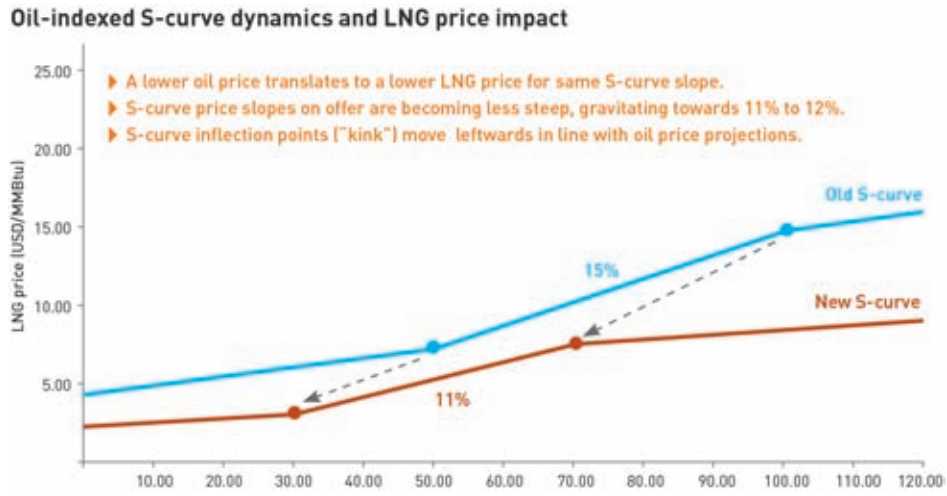
In this issue:

Asian prices and European regas are among issues evolving in LNG market

Industry players home in on supply and demand trends and the changing dynamics

The near-term outlook for the global LNG supply and demand balance, in combination with depressed oil and gas prices, is rapidly changing market dynamics.

The situation presents some key opportunities and risks to both supply-side and demand-side value chain players, delegates were told during one of the hundred presentations made at the LNG 18 conference that took place in Perth, Western Australia during April 2016.



Oil-indexed S-curve dynamics and LNG price impact

Singapore view

In the conference section on project development and finance, Matthew Tan of the Galway Group in Singapore made a presentation entitled "Opportunities and Risks for LNG Buyers and Sellers in a Changing Market Environment".

"With regard to LNG buyers, in particular end-users/consumers as well as aggregators, we observed that the opportunities presented by the current market may be accessible though in varying extents according to different buyer profile characteristics - LNG sellers are understandably looking to reduce their risk exposure.

"As expectations carry, "high quality" buyers would be best positioned to capitalise on procurement opportunities," Tan explained.

"Some LNG buyers may be stifled by the plethora of evolving and uncertain market factors. Others, however, may be tempted to overplay their hand as a result of their new found buying leverage," he said.

"With regard to LNG sellers, notably project sponsors and developers, we observed a base trend towards full risk mitigation mode.

Recovery

"Barring a quick recovery in oil and gas prices, LNG supply project economics are set to deteriorate and asset impairment could become a mainstay," Tan suggested.

"Whilst proposed projects face increasing challenges to sanction, the ability of existing projects and those under construction to keep afloat would increasingly depend on their capacity to adapt to the new market environment," he said.

Among other issues, the presentation covered price competitiveness.

Slope trend

"Buyers who solicit LNG supply offers from the current market would generally be able to procure competitively priced volumes compared to a year ago.

"As an illustration, consider the changes to oil-indexed S-curve price structures, an observed 'triple whammy' effect.

"First, oil prices have fallen. Thus, given a slope, the resulting price per million British thermal unit (MMBtu) of LNG will be lower, for example, 14 percent of US$70/barrel versus 14 percent of US$40/bbl.

"Second, S-curve slopes on offer tended to trend towards 12 percent to 13 percent, depending on the buyer's profile. In some cases, they may dip lower - which was allegedly the case for a certain Middle Eastern buyer.

"In case of buyers who exhibited increased risk profiles, the S-curve slope may be maintained at or above 13 percent - a recent example being the LNG supply tenders awarded by Pakistan to Gunvor and Shell.

"By and large, though, S-curve slopes have tended to be lower, which exacerbate the effect of lower oil prices for sellers but provide greater price competitiveness for buyers," Tan explained.

"Third, the kinks on S-curves effectively reflect buyers' and sellers' forecast outlook on oil prices. Whilst sellers are expected to want higher price floors (higher kink), buyers would push for lower price ceilings (lower kink).

"As illustrated, the shift to a reduced ceiling is reflective of the current market - lower oil prices and buyers' leverage," Tan said.

In another session covering "Markets and Trends", Richard Baylis of Uniper (formerly EON) Global Commodities raised the possibility of a new era for European regasification terminals.

Timespan

Baylis pointed out that over the first 20 years European regas capacity grew to 50 billion cubic metres per annum.

Then it stalled for about a decade before expanding to 200 Bcm per annum

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over the last 13 years. Several factors drove this last expansion: liberalisation, efficient combined-cycle gas-fired power plants, declining North Sea production and liquefaction capacity growth.

"However the 2008 global recession and the 2011 Fukushima disaster meant that European regas utilisation rates dropped dramatically from - 50 percent in 2000-2010 to just 15 percent in 2014," Baylis pointed out.

"Now the market is turning. With the wave of new liquefaction capacity and Asian demand cooling, we forecast utilisation rates of 50 percent," he stated.

"The most attractive terminals, with access to the liquid hubs, will become congested, regasification capacity will trade at a premium and capacity holders will recover some of their recent losses.

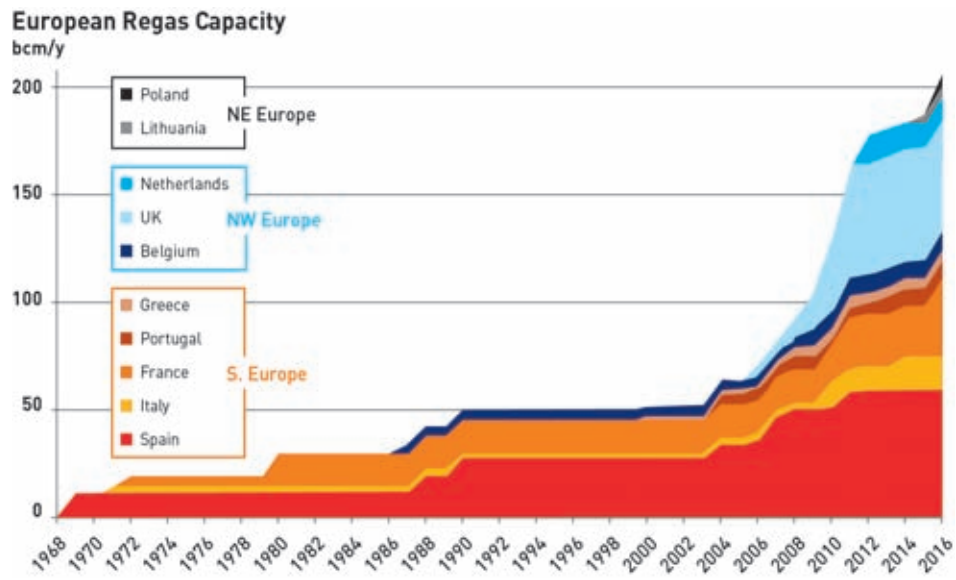
Forecast

"So are we entering a new, brighter future for European regas? Uniper believes that we are," Baylis stated.

He said that the Japan-Korea price marker has now fallen back to close to parity with European gas prices, and the Pacific-Atlantic spread has all but disappeared.

"The European markets are now looking an attractive proposition again, with their open access and potential for significant switching from coal to gas-fired generation.

"In Uniper we believe that over 50 percent of this additional volume will find its way into Europe - either directly, or displacing other swing suppliers which are currently delivering into Asia.



European regas capacity growth stalled for a decade, with virtually no increase taking place until expansion began from 2003 onwards

"We have already started to see flows to Europe picking up during 2015, but that is just the start.

"As a result, we forecast that by 2017-2018, we could see some of the European regasification terminals, particularly those providing access to the more liquid north-west European markets, becoming congested, bearing in mind that congestion will happen before reaching full capacity utilisation," he stated.

Importer body

The conference also heard some in-depth forecasts and overviews on the market, including one from Vincent Demoury, General Delegate of the France-based International Group of Liquefied Natural Gas Importers.

He gave an update from the new edition of his organization's annual report on the state of the LNG industry and the implications for commercial evolution.

"As it has been said on the first day of this conference, the further backward you can look, the farther forward you can see.

"Our goal with this report is to provide more market transparency to help you make well-informed decisions," Demoury said.

"First, stagnation is over. LNG imports last year grew by 2.5 percent, the equivalent of around 6 million tonnes, reaching 245.2MT at year-end, thanks to new supplies from the Pacific Basin.

"This is the highest level ever reached, exceeding by 4.4 MT the post-Fukushima record level," he said.

New buyers

"Second, LNG is reaching new areas, with three new countries joining the ranks of importers in 2015: Egypt, Jordan and Pakistan. This year we also decided to include Sweden in our statistics, since the country is now importing growing quantities of LNG via small-scale vessels," he said.

"Third, infrastructure is expanding: on the regasification side. Seven new terminals came online last year, bringing total capacity to around 777 MTPA. The global utilization rate is about 32 percent, with significant regional differences.

"Floating regasification terminals now represent 10 percent of the total capacity, 77 MTPA, about the equivalent of the production from Qatar," he said.

Demoury also gave the main findings on the import side.

He saw the rise of the Middle East as a key growth driver for LNG demand. The region's imports almost doubled, importing a combined 9.8MT.

On the on the other hand, Asian

"we forecast that by 2017-2018, we could see some of the European regasification terminals... becoming congested, bearing in mind that congestion will happen before reaching full capacity utilisation"

Rio Grande LNG / Image courtesy of NextDecade, LLC

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"China...continued on a growth trend despite a slowing gross domestic product"

demand declined by 1.7 percent. Decreases were particularly strong in Japan and in South Korea, where the weakness of power demand and the growing competition of other fuels for generation led to sharp decreases in LNG imports in both countries.

"These decreases were partly offset by growing demand in Thailand, in Taiwan and especially in Pakistan, who imported LNG for the first time last year.

"China, traditionally considered as a key factor for demand growth, continued on a growth trend despite a slowing gross domestic product," he said.

"In the Americas, LNG demand decreased by 8 percent. Demand declined in Argentina due to higher domestic production and in Brazil, mostly because of higher hydropower production and of a weak economic environment.

"The sharpest decline in the region affected Mexico, which experienced a 1.6MT drop due to higher pipeline gas imports from the US," he said.

As noted earlier, European net imports grew by 15.8 percent (5.1MT), not only because of additional imports but also because of fewer reloads compared with the previous year (with 3.6 MT reloaded in 2015 versus 6MT in 2014).

Trade flows

Demoury also looked at inter-basin flows, where he saw that the LNG market was still very much regionalized.

"This trend has been reinforced by the reduction in regional price differences in 2015 which reduced diversions and reloads due to limited arbitrage opportunities," he said.

Last year, LNG flows from the Middle East to the Pacific basin declined, as a combined result of additional push from the Pacific Basin and of lower demand in the Asia-Pacific region.

"As a consequence, some of the Qatari volumes previously delivered into Asia were displaced to the Atlantic Basin or to the Middle East," he said.

"On the other hand, lower premiums in Asia contributed to reduce Atlantic to Pacific LNG flows.

"Given its geographical location and the depth of its portfolio, Qatar remains the most diversified supplier, with 25 countries supplied last year, followed by Nigeria with 22 customer countries.

"By way of comparison, Australia supplied 13 countries last year. Australia's LNG flows mainly go to Japan and China, who purchased 83 percent of Australia's LNG production last year," Demoury noted.

Spot market

For the first year in 2015, Demoury's Importers' organization asked its members to report "true" spot trades.

He defined these "true" spot trades as physical delivery occurring less than 90 days from the transaction date.

"Although the results were partial and although we have observed some regional differences, our estimate is that around 15 percent of all LNG trade last year was done on this so-called 'true' spot basis.

"One aspect, although marginal of the spot and short-term markets, is the phenomenon of re-exports.

"International reloads continued to serve as a way to balance supply and demand and optimize portfolios.

"It is confirmed that 23 regasification terminals in the world had reloading capability at the end of 2015.

First re-loads

"Last year three new countries re-exported cargoes for the first time, the UK's Isle of Grain terminal, the Kochi facility in southwest India and the Singapore facility at Jurong Island, bringing the number of re-exporting countries to 10," he said.

"On the import side, 21 countries received re-exports. Three new countries received reloaded cargoes (Egypt, Jordan and Pakistan) absorbing together more than one fifth (21 percent) of total reloaded volumes," his survey said.

He asks if this phenomenon will continue to expand.

"When we look at the past five years, we see that reloads peaked in 2014, representing almost 3 percent of global trade. In 2015, they represented less than 2 percent.

"As we saw, in 2015, the reduced price differential between the Atlantic and the Pacific Basin translated into fewer arbitrage opportunities and less inter-basin trade.

"As a result, global re-loadings dropped by 31 percent last year, reaching 4.4MT versus 6.4MT in 2014," Demoury said.

Shipments

"Re-exports from Europe represented 83 percent of the total. Spain remained the leading re-exporter in the world with 26 percent of global re-exports, down from 60 percent in 2014.

"Re-exports are used to optimize portfolios when cargo diversions are not possible. As such, they can be considered as the tip of the iceberg, representing only a portion of flexible volumes," he said.

In his conclusion, Demoury point out that there were 15 new regasification terminals under construction at the end of 2015, eight of them in China.

China and India represented together more than 60 percent of current capacity under construction. The mature markets of South Korea and Japan represented only 6 percent of new capacity. ■

Petronas CEO says countdown begins for deployment of first FLNG hull off Sarawak

Malaysian company takes just four years to be world leader in floating liquefaction

Petronas Chief Executive Wan Zulkiflee bin Wan Ariffin said the Malaysian energy company had begun the countdown for the world's first floating LNG production hull to be deployed over the Kanowit natural gas field, offshore Sarawak.

The FLNG project is a landmark in the development of stranded gas reserves by means of floating production systems. It has, however, been a relatively quick transition by Petronas from planning to execution.

Schedule

The Kanowit FLNG hull was completed at the Daewoo Shipbuilding and Marine Engineering yard in South Korea and is scheduled to begin production in a couple of months.

The FLNG hull is named "PFLNG Satu" and is expected to produce 1.2 million tonnes of LNG per annum.

Engineers from Daewoo and France's Technip say the FLNG vessel was 97 percent complete and on target to come into operation in the third quarter of 2016.

The "PFLNG Satu" was moving out of DSME's Okpo shipyard just about four years after a final investment decision was taken in Malaysia to proceed with two FLNG projects.

The 365-metres long vessel tips the scales at 120,000 tonnes, with the hull itself weighing 80,000 tonnes and the topsides accounting for 40,000 tonnes.

It is first destined for the Kanowit field where it is expected to produce LNG for some five years.

At least two years before coming off service at Kanowit, Petronas said it aimed to decide which of its domestic gas fields will be the vessel's next assignment.

A second FLNG project planned by Petronas, the Rotan FLNG project for offshore Sabah, was postponed in 2015 as part of cost-cutting measures.

The Petronas FLNG plan is being advanced at a time when both Malaysia and neighbour Indonesia, who are Asia's leading LNG producers, are trying to meet their own rising domestic demand for natural gas.

Addressing the current downturn in the market in his speech at LNG 18 in Australia, the Petronas CEO said: "Collectively we must take bold steps and all the players must play a part. Each stakeholder can have a role.

"Petronas is a firm believer in the future of LNG. As a leading oil and gas multinational we will continue to reach out our hand to cooperation with the industry."

Bold steps

The CEO urged all stakeholders in the LNG industry to take a bold step to help curb the "vicious cycle" of LNG price volatility, while enhancing mutually-beneficial partnership among producers, buyers, industry contractors and governments to spur investments.

Wan Zulkiflee said the current state of the LNG industry, with lower prices and declining investments, was rooted in the collective actions of the various stakeholders.

Nevertheless, he remained bullish on the prospects of the industry, which is expected to grow 40 per cent by 2040.

"Collectively, we must take a bold step - we either continue to feed the vicious cycle, or tame it to serve our purpose.

"This is where all key stakeholders must play their part to create a more equitable LNG market, capable of supporting future investments for uninterrupted and affordable energy supplies to fuel the world's economies," Wan Zulkiflee added.

Long-term view

"For producers like Petronas, I believe it is about taking a long-term view and continuing to invest in hard and soft infrastructure through the cycles.

"We're not only investing in the upstream development projects, plants and LNG vessels but also in developing the capability of the people operating them - talents throughout the whole value chain from geologists, to plant technicians, right up to the mariners, LNG marketers and traders," he said.

Technology, he said, was a key investment area for Petronas as reflected in the development of the "PFLNG Satu" project.

"Another example was a pioneering technology to re-liquefy the boil-off-gas from LNG tanks and tankers during loading at the Petronas LNG complex in Bintulu on Sarawak," he added.

Wan Zulkiflee said that while Petronas remained committed to responding to customer needs with innovative commercial solutions, he urged buyers to understand that producers needed fair returns to maintain their LNG facilities and continue to reinvest in future supplies.

"I believe the conversation should now shift from just talking about the best price producers could offer to about the best value proposition and overall package they bring to the table in terms of supply security and flexibility of terms," he said.

Petronas CEO Wan Zulkiflee Wan Ariffin explains FLNG schedule

Shifting focus

Wan Zulkiflee said he would also encourage contractors and vendors aggressively to invest in research and development that made FLNG possible and offer other "game-changing technology to reduce costs, and execute innovative project management schemes in collaboration with developers to improve the delivery of projects."

The CEO said governments should introduce firm policies to support LNG use as an alternative to other fossil fuels and support more investment in infrastructure and resources.

Getting the "PFLNG Satu" off the drawing board came with seven key considerations, according to a Technip executive involved in the project and who also spoke at LNG 18.

The considerations were: safety and risk management, space constraints, design parameters, liquefaction technology, technical complexities, cost and reliability.

"These considerations are indeed the main challenges in executing an FLNG project, particularly the engineering, procurement and construction phase," according to Technip executive Manikandan Narayanan.

Consortium

He said that key to the success of "PFLNG Satu" has been the early

The 'PFLNG Satu' is being deployed over Kanowit natural gas field, located 180 kilometres offshore Sarawak

involvement of the consortium contractors, Technip and DSME right at the execution of the front-end engineering and design work.

"There were many challenges, of course, which had to be overcome in the design and engineering of such a complex facility, some of which were identified and addressed at the front-end engineering and design stage itself," Narayanan said.

"But the key considerations are critical as they are also intertwined so much with the push-pull effect, and sometimes conflicting," he said.

The "PFLNG Satu" was suitable to exploit fields with reserves of more than 300 billion cubic feet of gas. The vessel can operate in water depths of between 70 and 200 metres.

Floating Production Storage and Offloading units were the first offshore production units incorporating storage.

The initial units were converted oil tankers, and since then new units deployed have been a mixture of converted ships and new-build hulls.

This was the first application of a mixture of marine and oil and gas standards and regulations.

Historic

Throughout the history of FPSOs and FSOs the mix and the interfaces between these two different regimes have been understood better and better and managed better in execution of projects.

Certain projects and owner-operators have gone for a varied level of marine content. Among lease contractors, many of which have a heritage from shipping, there has been a wider use of marine 40

standards, particularly in the conversion of tankers to oil and gas production units. Aside from an FLNG barge project in the US state of Louisiana that was decommissioned a long time ago, all LNG production has been done onshore until the start-up of the Petronas project.

Other FLNG projects are set to follow, including Royal Dutch Shell's Prelude FLNG venture offshore Northwest Australia and two FLNG production units owned by Golar LNG and to be deployed offshore West Africa. ■

For the Record

AIR LIQUIDE, the French industrial gases company, said it had commissioned 12 biogas purification units to transform the gas made from waste into biomethane to inject it into the natural gas networks or turn it into liquefied natural gas for use as transportation fuel. The 12 new biogas purification units commissioned by Air Liquide are located in France, the United Kingdom, Hungary and Denmark. "Overall, Air Liquide has designed and deployed worldwide 50 biogas purification units in order to transform biogas into biomethane," said the Paris-based company. Biogas is produced during the treatment of waste from households, farming or industrial activities. "Biogas purification technology is based on the use of patented polymer membranes manufactured by Air Liquide," the company said. "This system separates the components of biogas, and generates a biomethane able to be injected into the natural gas network. Used as fuel in vehicles, bio natural gas or biomethane is also called bio-NGV (Natural Gas for Vehicles)," it added. In 2014, Air Liquide acquired FordonsGas, Sweden's leading distributor of bio-NGV, which operates nearly 50 stations in Sweden. These bio-NGV stations enable taxis, corporate fleets, buses and passenger cars to procure environmentally friendly fuel that is nearly 70 percent produced from renewable energies. Five of the latest 12 new biogas purification units in Europe represented a total investment of 12 million euros ($13.5M) and are operated by Air Liquide. "Air Liquide has developed technologies and expertise that span the entire biomethane value chain, including purification of biogas into biomethane, injection into the natural gas network, liquefaction and distribution for clean transportation fleets," it said. Francois Darchis, Senior-Vice President and Air Liquide board member, said: "These new biomethane production contracts illustrate the ability of Air Liquide to leverage its technologies to incubate new businesses. By positioning on the entire chain from biogas purification to distribution with bio-NGV stations, Air Liquide is contributing to meeting energy and environmental challenges."

AIR PRODUCTS, the world's leading equipment maker for LNG liquefaction plants, has decided to exit the energy-from-waste business and will take a hit of up to $1 billion on a UK project as it pledged to concentrate in future on its core natural gas industry sector. Air Products said it expected to record a pretax charge in the range of $900 million to $1Bln for discontinued operations, primarily to write down assets associated with the energy-from-waste segment. In previous public comments, Air Products management explained the challenges with the UK project near the city of Hartlepool in the northeast of England. "Testing and analysis completed during the company's fiscal second-quarter indicated that additional design and operational challenges would require significant time and cost to rectify," the US company said. "Consequently, the board has decided that it is no longer in the best interest of the company and its shareholders to continue the project. Exiting will allow the company to direct its resources to its core business of Industrial Gases," Air Products stated. The Lehigh Valley, Pennsylvania-based company most recently posted said first-quarter 2016 sales of $2.35 billion, a fall of just 8 percent from the same three months in 2015 as it was managing to weather the storm in the energy sector. Air Products has won contracts for ongoing LNG ventures around the world. They include Sempra's Cameron LNG project on the US Gulf Coast, the Cove Point plant in Maryland, the Ichthys project in Australia and the first Floating LNG venture in the world being developed by Malaysia's Petronas. Air Products had temporarily halted work on the energy-from-waste project site at Port Clarence, near Hartlepool, in November 2015, resulting in 700 construction workers being laid off. The initial plan was for the plant to generate energy for about 100,000 homes by burning domestic and commercial waste which would otherwise have been sent to landfill sites. "We pushed very hard to make this new EfW technology work and I would like to thank the team who worked so diligently," said Seifi Ghasemi, Chairman, President and Chief Executive of Air Products. "We appreciate the hard work of our employees and contractors at the site, and certainly understand their disappointment in this decision. We are also disappointed with the outcome," Ghasemi stated.

BANGLADESH Oil and Gas Corp. (PetroBangla) has signed a user agreement with Excelerate Energy for the Floating Storage and Regasification Unit the US company will deploy as Bangladesh's first import terminal. A signing ceremony was held in the capital, Dhaka, in the presence of Bangladesh government officials and executives of PetroBangla and Excelerate. The first floating LNG terminal will be located near the island of Moheshkhali, offshore the port of Cox's Bazar in the Bay of Bengal. An FSRU of 135,000 cubic metres capacity will provide natural gas to the southeast region of Chittagong, particularly for the power industry, according to the agreement. Excelerate was the same company involved in the setting up of Pakistan's first FSRU facility in 2015 at Port Qasim, near the city of Karachi. After receiving final approval from the Bangladesh government, PetroBangla will sign a 15-year charter deal with Excelerate for the FSRU vessel. Bangladesh, one of the poorest nations in Asia, is trying to develop its economy by building infrastructure to cover basic energy needs for industry and electricity for its largest cities. PetroBangla executives have said that the country needs at least two more LNG import terminals and in January 2016 sought expressions of interest from international and regional companies. The two additional LNG import facilities were outlined by PetroBangla in its initial tender documents and will be near the ports of Cox's Bazar and Payra. PetroBangla has said that after the FSRU is brought into service it would prefer two land-based LNG terminals. The country is initially aiming to increase natural gas supply through LNG imports to reduce power blackouts. It would also be seeking to extend a memorandum of understanding signed with Qatar to supply LNG to a terminal from around 2017. Bangladesh does produce quantities of natural gas with official output from onshore sources put at 710 billion cubic feet. The Asian nation, whose neighbours India and Pakistan are both now LNG importers, is estimated to need 35 percent more natural gas than it currently consumes just to eliminate shortages, according to a US report.

BEAR HEAD LNG Corp, the project development company in Nova Scotia, said it was taking steps to ensure the venture had a skilled workforce to build the liquefaction plant and other facilities on the shore of the Strait of Canso in Richmond County. The project's parent company, LNG Ltd. of Australia, has recently named a new Managing Director, Greg Vesey who is also President of Bear Head LNG. Bear Head LNG currently has all the initial federal, provincial, and municipal regulatory approvals required to begin project construction. Canada's National Energy Board has granted Bear Head approval to export up to 12 million tonnes per annum of LNG. It also has permits from the US Department of Energy to use feed-gas from across the border and ship it to countries with Free Trade Agreements with the US and to those that don't. Vesey said that as part of its future workforce training programme it had signed a memorandum of understanding with training organization, LearnCorp International (LCI). "We are pleased to secure this agreement with LCI, globally recognized as a leader in training for the oil and gas as well as LNG sectors," said Vesey. "Over the next several years, Bear Head LNG will need hundreds of skilled workers to safely construct, operate, and maintain its facility. Together, Bear Head LNG and LCI will provide the certified training needed," he stated. Vesey is also charged with moving forward the Magnolia LNG project his company is developing in the US state of Louisiana. Both Bear Head and Magnolia will be mid-scale ventures, each with initial capacity of 8 MTPA of LNG. Vesey said his company was committed to supporting the local economy in Nova Scotia by providing economic and social benefits for the region, First Nations communities and the province. "The agreement with Bear Head LNG enables LCI to harness its expertise right here at home in Cape Breton. We look forward to working with Bear Head LNG on this exciting project," said Lucia MacIsaac, President of LCI. "LCI will provide internationally recognized instructors, curricula and technical support to assist Bear Head LNG through the development and delivery of courses and programs," she stated.

BOC of the UK, a subsidiary of Germany's Linde Group, is set to open its first LNG fueling unit for trucks on an existing fuel forecourt in Britain and with full public access. The UK operator said its LNG refueling unit for heavy-goods vehicles would be sited at Exelby's Golden Fleece Service station on Junction 42 of the M6 motorway south of the city of

Carlisle in Cumbria. "Exelby Services pioneered fuel bunkering, a contract diesel refueling system that allows haulage companies to make large savings on the cost of diesel," BOC said. Now Exelby is one of the largest independent bunkering suppliers in the country, handling over 140 million litres of diesel each year through its five fuel sites in the North of England. BOC explained that the company's sites were designed with trucks in mind and store fuel for most of the major transport, distribution and fuel card companies in the UK. "The addition of BOC's LNG refueling unit represents an important step into the low-carbon fuel market for Exelby Services and will significantly add to its offering at its Golden Fleece, Carlisle service station," the UK company said. The BOC LNG refueling unit uses cryogenic cooling to "temperature-condition" the fuel just prior to dispensing, and also incorporates the unique "zero loss" refueling technology, developed by the company. BOC said its LNG technology uses nitrogen to keep the liquid LNG in the fuel tank at a constant super chilled temperature and this prevents the liquid from turning into a gas. The result is a "zero loss system" that allows no harmful greenhouse gases into the atmosphere. The same system can draw warm gas from a vehicle tank and return that back to a liquid form. Managing Director Michael Exelby, whose father Ron established Exelby Services in 1976, commented: "Low carbon is an important part of Exelby Service's environmental agenda and we are delighted to be able to offer LNG fuel to our HGV customers." BOC pointed out that diesel produces around 2.6 kg of CO2 for every litre burned, whereas LNG when used with diesel in a dual-fuel vehicle typically reduces CO2 emissions between 10 and 14 per cent. LNG also produces virtually no sulphur dioxide (SO2) emissions, less nitrogen oxide (NOx) emissions and less solid particle emissions than other fuels. Mark Lowe, LNG Business Manager, BOC, said: "BOC is proud to be working with Exelby as a partner on this important, environmentally friendly

alternative to diesel. Our partnership with Exelby further demonstrates BOC's long-term commitment to play an active part in the transition to low-carbon transport. This is the first part of our plan to provide LNG on-road fueling across the UK's HGV road network."

BRITISH Columbia Minister of Natural Gas Development, Rich Coleman, paid what was described as "a business-development trip" aimed at fostering better ties "with LNG partners headquartered in Tokyo." He reassured Japanese energy companies in Tokyo that opportunities were still on offer despite slow progress or postponements among about a dozen export ventures. Japan is the world's largest LNG importer and has several companies involved in projects in the province. However, the energy downturn caused by low oil prices and the slow regulatory process in Canada has meant some LNG projects have been overcome by events beyond their control. "Building partnerships with companies in Japan and with companies in other parts of Asia will strengthen our trade prospects and attract the investment we need to diversify our natural gas sector and create jobs for British Columbians," said Coleman. While in Tokyo, he met with executives of several leading companies involved in the LNG business in Canada and elsewhere. These included Japan Petroleum Exploration Co., a company holding a 10 percent interest the Pacific Northwest LNG project led by Malaysia's Petronas and worth, according to the Canadians, C$36 billion (US$28Bln) in terms of investment. Coleman also met executives of Mitsubishi Corp., an investor in Royal Dutch Shell's currently postponed LNG Canada venture, "representing up to $40Bln in new investment and approximately 5,500 jobs during peak construction," his office said. Mitsubishi is one of Japan's largest trading companies and has also been supporting exploration and production activities in BC for four years as part of its C$2.9Bln investment in the Montney Shale area of the provinces northeast. The LNG plans envisage that shale-gas will be transported by pipeline from the Montney and other shale and conventional gas areas to liquefaction and export plants built on the Pacific coast. Coleman additionally met with executives of other companies, including Inpex Corp. and JGC Corp. who are working together on the Aurora LNG venture proposed for Digby Island and costing C$20Bln. The minister also held talks with Japanese refining company, Idemitsu Corp., a partner of Canada's Altagas that recently cancelled its Douglas Channel LNG project near the town of Kitimat.

CALIFORNIA company SCT&E LNG that expanded into energy from telecoms has signed its fourth preliminary LNG supply agreement for the liquefaction and export facility it plans to build on Monkey Island in Cameron Parish, Louisiana. "This multi-billion dollar agreement was signed with a reputable Asian energy company that owns and operates an LNG import terminal and has plans to construct additional terminals," the company said. "The agreement also has an option for a future equity investment into the LNG liquefaction terminal," it added. The LNG development company is led by Chairman and Chief Executive Greg Michaels and is known as SCT&E LNG, under part of the name of the originally established Southern California Telephone Company, a privately-held United States Public Utility. The project site for the SCT&E LNG liquefaction and export terminal is located on Louisiana's Calcasieu Ship Channel. The site is about 2.5 miles inland from the Gulf of Mexico and with a building area on the island of 245 acres. The company's business model seeks to export LNG via take-or-pay tolling agreements and is focused on supplying LNG to meet customer needs during what it sees as a "second wave" of LNG demand in 2022 and beyond. In 2015, SCT&E LNG signed two Memoranda of Understanding (MOUs) a total of 1.7 million tonnes per annum of LNG, and the company signed a third MOU earlier in 2016. This fourth and latest agreement, combined with the previously signed MOUs, brings the company's total offtake agreements up to 4.7 MTPA. "SCT&E LNG now has over one-third of the facility's overall capacity reserved via MOUs," said CEO Michaels. "We have seen an increase in commercial activities from clients looking to secure LNG supply beginning in 2022, and it is great to see LNG buyers confirm our business decisions and market timing," added Michaels. "The Monkey Island liquefaction plant has deep-water frontage access on the Calcasieu Ship Channel and additional marine access on the Cameron Loop along the island's northern bank," the company said. The SCT&E LNG project currently contains plans to have four LNG Trains, each with capacity to produce 3 MTPA. The company's initial plan also envisages three LNG storage tanks, each with capacity for 160,000 cubic metres of fuel. SCT&E LNG is a corporation registered in the state of Nevada and with an office in Houston, Texas. It holds a US Federal Energy Regulatory Commission permit to buy and sell energy nationwide and the parent company's head office is in Temecula, California. The company was originally founded in 1994 as Wholesale Airtime, Inc. by Michaels. Its focus now, apart from LNG and energy, is on telecommunications networks and it maintains facilities on both coasts of the US.

CHENIERE Energy, operator of the Sabine Pass liquefied natural gas export plant in Louisiana, told US regulators its second project, the Corpus Christi LNG development in Texas, was almost a third complete and the first liquefaction Train was on track for start-up in 2018. In its latest progress report to the Federal Energy Regulatory Commission, the Houston-based company said construction at Corpus Christi was 32.5 percent complete compared with a 30.7 percent completion point reached at the start of February 2016. The Texas liquefaction plant is being built on the shore of Corpus Christi Bay, at the north end of the La Quinta Channel. The contractors are led by Bechtel Inc. The San Francisco-headquartered firm has two lump-sum turnkey contracts with Cheniere for the engineering, procurement and construction work at Corpus Christi and is currently completing the Sabine Pass plant. The Phase 1 EPC contract for Corpus Christi includes building two LNG Trains, each with 4.5 million tonnes per annum of capacity, two storage tanks, one complete berth and a second partial berth. The contract for Phase 2 includes one LNG Train, one additional tank, and completion of the second berth. The total capacity will be 13.5 MTPA. "Procurement has progressed to 46.0 percent, Bechtel's direct hire construction through March has progressed to 4.6 percent. The total project has progressed to 32.5 percent complete," Cheniere told the regulator. The report noted that latest engineering work at Corpus Christi focused on continuing to update design for power plans, lighting and grounding. "Procurement continues to support construction's schedule with supply of materials, delivering 4,427 tons of structural steel and 1,910 tons of rebar to site," it said. "Construction focused on progressing permanent plant concrete and steel, underground pipe, and above ground pipe. For site preparation work, construction completed the sheet piles at the Material Offloading Facility. In the month of March, Bechtel completed concrete placements for the Tank A second wall lift, Train 1 Compressor Area ethylene columns, Train 2 Compressor Area methane mat base slab as well as continued OSBL concrete installation in Refrigerant Storage Area, Flare Knockout Drums, and OSBL Utility Pipe Racks," it explained. Cheniere also said that dredging work for the export terminal was continuing, though was temporarily shut down in March to allow marine construction to progress further. "Dredging is anticipated to commence again in May 2016," it said. The Trains are being designed, constructed, and commissioned using the ConocoPhillips Optimized Cascade technology. The Texas plant's current cargo sales agreements amount to more than 9 MTPA, or two whole Trains of production.

CHENIERE and its Sabine Pass plant in Louisiana has received an order issued by the US Federal Energy Regulatory Commission to introduce feed-gas and refrigerants for the initial commissioning phase of the second processing Train. The first export shipment of LNG produced in the Lower 48 states left the Sabine Pass plant on February 24, 2016, and was delivered to Brazil. The cargo loading and successful delivery were the result of a decade of natural gas production growth that has put the US in a new dominant position in worldwide energy. The Sabine Pass plant suffered technical setbacks in early 2016 and Cheniere told the regulator at the time that the full completion dates for Train 1 was May and Train 2 was August, though commissioning cargoes can still be exported during the process. The previous report to the FERC had said Train 1 and Train 2 would be fully completed in March and June respectively. "This approval is based on FERC staff inspections and review of the information filed. Your filing is also consistent with Environmental Condition of the Order for introduction of feed gas and process fluids into the Heavies Removal Unit facilities within Train 2," it explained of the initial stages of commissioning. Cheniere's Sabine Pass facility will consist of six different Trains, with the five others at various stages of development and with a

total capacity permitted by FERC of 4.16 billion cubic feet per day of feed-gas. The completed six Trains will each have a nameplate capacity of 4.5 million tonnes per annum of LNG for 27 MTPA in total production. Four LNG export terminals are currently under construction, including Cheniere's Corpus Christi plant in Texas, Dominion Energy's Cove Point in Maryland, Sempra Energy's Cameron terminal transformation in Hackberry, Louisiana and the Texas Freeport LNG plant on Quintana Island. The new US LNG export plants are expected to take advantage of natural gas produced in the Appalachian Basin, particularly the Marcellus and Utica regions, the source of much of the nation's production growth over the past several years. The Sabine Pass project has secured 300 million cubic feet per day from the Texas Gas Transmission Ohio-Louisiana Access Project, which facilitates additional flows of Marcellus and Utica natural gas to the southern US.

CHEVRON Corp. said its Wheatstone venture in Western Australia has signed a natural gas agreement with Alinta Energy for the local domestic market in addition to current LNG supply agreements with Japanese utilities and at least one Chinese energy company. The agreement for the delivery of 20 petajoules (19 billion cubic feet) a year of natural gas for seven years starting in 2020 is the first domestic gas sales deal from the Wheatstone LNG venture. Chevron currently supplies about one tenth of Western Australia's domestic gas needs through its stake in the North West Shelf venture. Wheatstone will now deliver more domestic gas to the Western Australian market in 2018. The Wheatstone project is under construction near Onslow, Western Australia, and will consist of two LNG export Trains with a combined capacity of 8.9 million tonnes per annum and a domestic gas plant. Around 85 percent of Chevron's equity LNG from the Wheatstone Project has been committed to premier LNG buyers in Japan and elsewhere. The most recent LNG sales deal was a Heads of Agreement signed in December 2015 with China Huadian Green Energy Co. for up to 1 MTPA of LNG over 10 years starting in 2020. Gas from the Wheatstone domestic plant is being marketed separately by the Wheatstone joint venture partners and will be delivered from Onslow via a pipeline to an inlet point on the Dampier-Bunbury Natural Gas Pipeline. Chevron will supply even more gas to local suppliers once the domestic gas plants at the Gorgon and Wheatstone LNG projects begin production. The US major is the operator of both LNG projects. Under Western Australia's state's energy law, all LNG projects are obliged to supply natural gas into the local markets under a gas reservation policy. Alinta is a US-owned gas and electricity retailer with its headquarters in Sydney and over 800,000 residential, commercial and industrial energy customers on its books. The utility is owned by US equity fund TPG Capital and is currently up for sale. "This agreement is an important step in Chevron's rapidly expanding domestic gas business in Western Australia and the establishment of our leading domestic gas portfolio across the Wheatstone, Gorgon and North West Shelf projects," said Roy Krzywosinski, the head of Chevron's operations in Australia. Alinta Chief Executive Jeff Dimery said the Wheatstone agreement "provides long-term certainty for Alinta's gas portfolio and a firm foundation for Alinta's future gas supply to the West Australian market." The Wheatstone project is a joint venture between Chevron with over 64 percent of the project and the balance being held by Kuwait Foreign Petroleum Exploration Co. (13.4 percent), Woodside (13 percent), PE Wheatstone Ltd, partly owned by Tokyo Electric Power (8 percent) and Japan's Kyushu Electric Power Co. (1.46 percent).

CHINA National Offshore Oil Corp. said it had launched its largest liquefied natural gas carrier, named the "Pan Asia" with 174,000 cubic metres capacity and one of four being constructed by Hudong-Zhonghua Shipbuilding Group to carry shipments mainly from the Queensland Curtis export plant in eastern Australia. The vessel, which still has to be fitted out, is being built at the main shipyard in

Shanghai and is expected to carry around 1.5 million tonnes per annum of cargoes from 2017 from the coal-seam-gas-to-LNG plant on Curtis Island, near the port of Gladstone, where CNOOC has a stake. The Chinese energy company originally purchased the stake and agreed to build the ships under an agreement with the facility's original developer, BG Group of the UK. The CNOOC partner in QCLNG is now owned by Royal Dutch Shell after its takeover of BG. The four LNG carriers will be owned and operated by a consortium consisting of BW Gas, Teekay LNG Partners, CNOOC Energy Technology and Services and China LNG Shipping. China's Export-Import Bank provided $400 million in initial financing for the start of the newbuilds programme. Following the delivery of the vessels between September 2017 and January 2019, they will work the Australia-China route. Teekay LNG Partners acquired a 30 percent ownership interest in the first two carriers. "The LNG carriers are an important part of the industry chain. It enables us to buy this clean energy from countries of origin at very cheap prices and supply to our customers," said Yu Hua, Deputy Chief Engineer of CNOOC Energy Technology & Services Co. China is now the world's third-largest LNG importer and is aiming to increase its annual total of imports that in 2015 totalled 20.02 million tonnes. The "Pan Asia" is 290 metres long and 45 metres wide, larger than any previous LNG carriers built in China in terms of length and capacity, CNOOC said. The Chinese company said one shipment of LNG from the vessel will be able to supply domestic households in the city of Shanghai itself with sufficient natural gas for almost a month. "Constructing an LNG carrier is considered one of the most challenging tasks in shipbuilding, particularly its storage tanks," CNOOC said. All four Chinese vessels will use well-proven LNG storage tanks from GTT, the French tank technology company. GTT's No. 96 membrane-type containment system is being used. "The storage tanks are made of a special steel, with more than 60,000 thermal-protective boxes. Workers need to weld them one by one in an environment with constant temperature, pressure and humidity. It is very challenging," said Chen Ruiquan, Deputy General Manager of CNOOC Energy Technology & Service-Oil Production Service Co. The interior fixtures and fittings of the first carrier will be assembled and it will be tested before commencing operations in less than 18 months.

CLOUGH, the Australian engineering company, said it won a major services contract from the nation's largest LNG operator, Woodside Energy, while continuing to build up its own North American business. Clough said the Woodside contract covers "the full spectrum of engineering services" and includes concept and feasibility studies, front-end engineering and design, assessment and review, detailed engineering and production support across all of Woodside's operated onshore and offshore producing assets. "We are delighted to be selected as an engineering partner by our key client Woodside," said Clough's Chief Executive Peter Bennett. "Over the past two years, we have worked hard to lower our cost base and increase productivity by investing in our engineering and project management systems and talent development," Bennett added. "This contract award sees this investment come to fruition, and reinforces Clough's capability to work across asset life-cycle while building upon our established brownfields engineering credentials," the CEO said. "Our brownfields engineering team will deliver fit-for-purpose engineering solutions that reduce capital expenditure and operating expenditure costs while increasing safety, productivity and schedule certainty," he stated. Woodside operates two existing plants in Western Australia, the NorthWest Shelf venture and Pluto LNG. Additionally, Woodside is involved in the Wheatstone LNG project as a shareholder with Chevron Corp. The Julimar offshore gas project, operated by Woodside, will provide feed-gas for the Wheatstone plant from 2018 and is more than 80 percent complete. Clough noted in its statement that it was also building its LNG activities in North America, through its global LNG consultancy unit, CH-IV. The US subsidiary was awarded an owner's engineer contract for Eagle LNG in Jacksonville, Florida. As owner's engineer, CH-IV is responsible for the initial engineering plan and completion of the US Federal Energy Regulatory Commission application for the facility. The small-scale Eagle liquefaction plant will consist of three production units, with each capable of producing up to 500,000 gallons per day (0.33 million tonnes per annum each). "The facility will include one LNG storage tank, a marine load-out facility and dock that would accommodate small to mid-size LNG vessels as well as bunker barges for domestic ship fuelling and an LNG truck-out facility," Clough said.

DELEK Group, the largest Israeli energy operator in the East Mediterranean with stakes in the Tamar and Leviathan natural gas fields and LNG project plans, said the Tamar field reached peak production with record sales to Israel of 8.3 billion cubic metres in 2015, three years after coming on stream. Delek's subsidiaries Avner Oil and Delek Drilling own stakes in the prolific Tamar and Leviathan fields with main partner, Noble Energy of the US. The Israeli group also said in its latest earnings that it managed to return a small net profit compared with a loss of 765 million shekels ($204M) in 2014. Delek said the Leviathan field partners submitted a revised development plan with increased maximum capacity of 21 Bcm of natural gas per annum from 16 Bcm previously and signed a first agreement with a local off-taker for the supply of natural gas for power plants. That's despite Leviathan development plans for an estimated 22 trillion cubic feet of resources offshore Israel suffering a setback when the Israeli High Court on March 27, 2016, rejected part of a regulatory framework supported by Prime Minister Benjamin Netanyahu. However, the partners in the East Med's largest field said the Israeli court ruling that blocked the government's proposal to regulate the natural gas industry would delay but not end the Leviathan development plans. The Leviathan field has the potential to supply customers in Israel, Jordan, the Palestinian Authority and Egyptian LNG processing plants. "This year will be marked by the advancement of the development plan of Leviathan, as well as continuing to identify opportunities and making strategic investments in the international energy market," said Assi Bartfeld, President and Chief Executive of Delek. "With regard to the recent Israeli High Court of Justice decision on the Natural Gas Outline, most of the Outline's sections were upheld with the exception of the stability clause. One of our main goals in 2016 is to progress with the development of Leviathan. The latest plan, submitted to the Petroleum Commissioner, enables an accelerated schedule that will allow for first gas flow to the Israeli market in 2019, with maximum production capacity at the final stage of the first development phase at approximately 21 Bcm per year," the CEO said. "We have already started discussions with the government ministries in order to reach a solution," Bartfeld explained. The company declared a dividend of 100 million shekels for the fourth quarter and 450M shekels was distributed for 2015.

DUTCH import terminal Gate LNG said it performed its first trans-shipment operation at the facility in the port of Rotterdam as it catches up with other European terminals. The LNG trans-shipment between the 140,000 cubic metres capacity K-Line carrier "Arctic Discoverer" and the 151,000 cubic metres capacity Exmar vessel "Express" was carried out for the Danish company Dong Energy, which has capacity at the Gate terminal. The Gate terminal, a subsidiary of Dutch utility and transmission company Gasunie and global storage giant Vopak, has brought in trans-shipment services behind schedule as they were originally planned for the second-half of 2015. During trans-shipment, LNG will be unloaded at one jetty and loaded at the other jetty without the LNG passing by storage tanks. The Rotterdam facility is trying to catch up with other European terminals where trans-shipments are more regular occurrences such as Montoir-de-Bretagne in France, operated by Elengy. Belgium's Zeebrugge facility is also planning to trans-ship cargoes on a regular basis from the Yamal LNG plant in Russia when it comes on stream in 2018. "With trans-shipment, Gate aims to strengthen its role in linking large-scale markets and small-scale LNG markets in Northwest Europe," the company said. The Gate terminal is evolving into a European LNG hub with a planned break-bulk facility for Royal Dutch Shell. It is also increasing the number of truck-loading with LNG which in 2015 rose to 788 from 174 in 2014. However, shipping has been lagging. In 2015, the number of unloaded ships was 21 versus 14 in 2014, which was not seen as a big increase. The number of loadings of large tankers and small-scale carriers increased from 20 in 2014 to 28 in 2015.

ENGIE, the French utility and energy company and the Egyptian Natural Gas Holding Co. (EGAS) have signed a cooperation agreement on liquefied natural gas imports to Egypt. "As a long

lasting partner of the local gas industry, Engie will contribute to supplying Egypt's gas market," the French company said, without giving any details. The accord was signed during the state visit to Egypt of France's Socialist President Francois Hollande, who was accompanied to Cairo by French business leaders, including Engie's Chief Executive-elect Isabelle Kocher. Engie's Kocher will formally take over the top job on May 1 at Engie, formerly known as GDF-Suez whose predecessor companies built the Suez Canal in Egypt. GDF-Suez's name originated during the 2008 merger between Gaz de France and the Franco-Belgian firm Suez. Egypt has been an LNG importer since 2015 when two Floating Storage and Regasification Units were deployed at the port of Ain Sokhna in the Gulf of Suez. The Egyptians turned from exporters of LNG to importers in April 2015 to satisfy their growing domestic natural gas consumption, which has increased by an annual average of 7 percent over the previous 10 years. Egypt stopped producing LNG more than two years ago as natural gas supplies were diverted by the state energy companies, including EGAS, to satisfy pipeline high demand in the domestic market. CEO-elect Kocher will replace the longtime Engie and GDF-Suez CEO Gerard Mestrallet who is due to retire. Analysts said the new company name of Engie focuses on Kocher's desire to slowly shed the company's hydrocarbon focus. Kocher was appointed deputy CEO in late 2014 as part of a succession plan for Mestrallet, who has led the company for 20 years. She had been Engie's chief financial officer for three years before becoming deputy CEO. The new renewable energy focus of Engie was illustrated by the other part of its Egyptian statement that described a host of new renewable energy projects in Egypt such as the financing, construction, operation and maintenance of solar ventures and wind projects.

FINLAND has begun sea trials for the world's first LNG-powered icebreaker named "Polaris" and built at the Arctech Helsinki Shipyard. The icebreaker will be

powered by both diesel and LNG, which will enable its compliances with new ship propulsion emission regulations in Northwest Europe. The main purpose of the dual-fuel vessel is icebreaking and assisting vessels in ice conditions at sea. Designed for a 50-year service life, it is scheduled for delivery to its owner, Arctia Shipping, for the winter season of 2016. Arctia is owned by the Government of Finland and already has eight ice-breaking ships in its fleet. The shipping company's business is the provision of icebreaking services and charters. Arctech said the newbuild "Polaris" will be able to move continuously through ice that is up to 1.6 metres thick. It can also break a 25-metre wide channel in 1.2 metre-thick ice at speed of 6 knots, as well as to reach 9-11 knots of average assistance speed in the Baltic Sea. In open water, the ship's service speed will be minimum 16 knots. While the main purpose for the vessel is icebreaking, it will independently be able to perform oil spill response operations and emergency towing under demanding conditions. "The vessel will fulfil the international IMO Tier III emission standards, and the special requirements for sulphur emissions in the Baltic Sea," the yard said. "The vessel has been designed according to the zero emission principle, which means that no waste or polluting substance will be discharged in the sea. All solid and liquid waste will be stored on board and unloaded ashore. The double hull arrangement protects all the vital tanks on board," it added.

FLINT HILLS resources, based in Wichita, Kansas, has been authorized by the US Department of Energy to export around 120,000 gallons per day of LNG over a 20-year period from an existing small-scale liquefaction facility in George West, Texas. Flint Hill said the exports from the liquefaction plant owned by Stabilis LNG would go to nations which have in place a Free Trade Agreement (FTA) with the US. The company said that it anticipated the points of export to include the Port of Brownsville, the Port of Houston and the Port of Corpus Christi, all located in Texas. The order states that the DoE will issue a separate order on the Flint Hills application to export LNG to non-FTA nations. Flint Hills told the DoE that it intended to export the LNG in a volume equivalent to around 3.62 billion cubic feet per year of natural gas. The company said the Stabilis-owned liquefaction plant is currently operational and can accommodate both International Standardization Organization (ISO) containers transported on ships, or LNG loaded onto trucks. "Flint Hills, therefore, asserts that no additional plant infrastructure will be required as a result of the proposed exports." The company asked the DoE for the authorization for 20 years of exports to commence within three months of the permit being issued. "Flint Hills requests authority to export this LNG on its own behalf and as agent for other entities who hold title to the LNG at the time of export. The portion of the application that seeks authorization to export US LNG to non-FTA countries is still under review".

GAS AUTHORITY of India (GAIL), the country's main natural gas transmission company, is the buyer of the second shipment of LNG from Cheniere Energy Inc.'s Sabine Pass plant in Louisiana in a transaction that makes it the first Asian importer of US shale gas. The nation's biggest supplier will receive the cargo, bought on spot basis, at the Dabhol import terminal near the West Coast city of Mumbai in several days. Currently India's four operating import terminals are on the West Coast of the country, though plans are progressing for the first East Coast terminal at Kakinada. The 155,900 cubic metres capacity LNG carrier "Clean Ocean", owned by Greek company Dynagas, left Sabine Pass on March 15 and took the route to India round the Cape of Good Hope off South Africa instead of the Suez Canal via the Mediterranean. Some analysts had expected the second US cargo from Louisiana to be headed for Brazil like the first shipment. Energy consultants Genscape Inc., which has its US headquarters in Louisville, Kentucky, and its European base in Amsterdam in the Netherlands, has infra-red cameras pointed at the Sabine Pass export plant to monitor shipping movements. The third and fourth cargoes departed from the facility during late March, according to the firm. Cheniere's fifth cargo from Sabine Pass is scheduled to be shipped on the 162,400 cubic metres capacity "BW Suez Brussels", according to shipping data. Gail's US LNG shipments are scheduled to increase in the the future from current main supplier Qatar and from Australia and the US as it has signed up to receive 10 million tonnes per annum of LNG deliveries from those countries. It is also a significant buyer of spot cargoes in the current lower-priced market. India imported 14.60MT of LNG in 2015, though by 2020 the country's imports are expected to have risen to around 28MT from less than 10MT in 2010.

GAZMETRO, the largest natural gas distribution company in Quebec with its network of over 10,000 kilometres of underground pipelines, has welcomed the French-speaking Canadian province's new energy policy that will underpin increased use of liquefied natural gas as a fuel for road and marine transport and small-scale distribution. Quebec's new "Energy Policy 2030" has just been unveiled by Quebec Premier Philippe Couillard, accompanied by Pierre Arcand, the provincial Minister of Energy and Natural Resources. "We welcome the vision the government is putting forward in this 'energy of transition' policy to enable us to meet the challenges facing our society by advocating the development of a lower-carbon economy," said Sophie Brochu, President and Chief Executive of Gaz Metro. "With its proven expertise and leadership in energy efficiency, with the use of natural gas instead of higher-emission energy sources, particularly in the industrial, heavy freight and marine transport sectors, Gaz Metro is already deploying solutions that meet the energy imperatives of today and tomorrow," the CEO said. Gaz Metro's liquefaction, storage and regasification plant in eastern Montreal has been in operation for 45 years and is being expanded. It can currently produce LNG equivalents of three billion cubic feet per annum of natural gas. The plant also has LNG storage tanks with a capacity of about 95,400 cubic metres of LNG, 25.2 million US gallons. The plant has a loading dock which is used to supply tanker trucks that then supply refueling stations for plants and transportation companies. With cooperation of the government of Quebec, Gaz Metro has already become a partner in the process to increase "accessibility to LNG starting in 2016." The project to increase Gaz Metro's LNG plant production capacity would help it meet part of the growing demand for natural gas for road and maritime transportation markets, and in regions remote from the gas network, particularly areas of the Cote-Nord and Nord-du-Quebec. "The new policy will make it possible to step up the deployment of these initiatives, for example by encouraging the production and distribution of renewable natural gas (biomethane), fostering the acquisition of natural gas vehicles and by promoting the use of natural gas as fuel through the deployment of natural gas fueling points in Quebec," Brochu added. "The policy echoes the majority of the proposals we put forward in consultations the government conducted in preparation for formulating the policy," she said. "We note with enthusiasm that, for example, the government has reiterated its wish to help provide the various regions of Quebec with access to natural gas (gaseous or liquefied). We are also happy to learn that Gaz Metro will have some leeway with regard to acquiring the natural gas transport capacities needed to facilitate and encourage major industrial companies that wish to set up in Quebec or convert their processes to natural gas," Brochu said. "Quebec's Energy Policy 2030 gives a clear signal to the players in our industry that they must be proactive and imaginative in putting forward solutions in response to the challenges involved in reconciling climate change with economic development in Quebec in order to bring about a greener, more prosperous future," Brochu concluded.

IGU, the International Gas Union, said in its annual report that the global LNG industry is poised for growth and plays a key role in expanding access to natural gas in the world's future energy mix. "Natural gas is a vital energy resource that can lead to a lower carbon future, cleaner air in metropolitan areas, and a prosperous economic future," the IGU declared in its report released at the LNG 18 conference in Perth, Western Australia. LNG trade in total reached 244.8 million tonnes in 2015, up 4.7MT from 2014 and the largest year ever, surpassing the previous high of 241.5 MT set in 2011. "The LNG industry has developed to a point where the necessary foundations have been built to turn natural gas into a truly global commodity, enhancing both energy security and meeting growing demand," said IGU President David Carroll. "Although the Pacific Basin remains the largest source of demand, growth was driven by Europe and the Middle East. New regasification markets formed in Egypt, Jordan, Pakistan and Poland, just in time to benefit from near record-low prices. The decline in oil prices and growing weakness in Pacific demand led all global LNG price markers to fall in 2015, from

an average $15.60 per million British thermal units in 2014 to $9.77 per MMBtu in 2015," the IGU report said. The body, one of the organizers of the LNG 18 conference in Perth, said liquefaction capacity reached 301.5 MTPA. A further 142 MTPA of liquefaction capacity was under construction worldwide as of January 2016 and final investment were expected on two more US projects and an African FLNG venture in Cameroon. "While the natural gas industry is undergoing fundamental changes as it operates in a historical low-price environment, the fuel can be a critical part of the globe's future energy mix more than ever," it added. "Natural gas accounts for roughly a quarter of global energy demand, of which 9.8 percent is supplied as LNG," the report added. The IGU report explained that gas has many important benefits, citing its abundance and flexibility and its "perfect complement to intermittent renewables for power generation."

INPEX Corp., the Japanese energy company and Asia-Pacific LNG project developer, said it had been instructed by the Indonesian government to re-propose a plan of development for the Masela Block natural gas resources previously planned as a floating liquefaction venture. Indonesia said on March 23 it had decided against a proposal by Inpex for the Abadi FLNG project in eastern Indonesian waters and would instead proceed with plans to process the gas resources onshore. The original Inpex plan with Royal Dutch Shell was to produce 7.5 million tonnes per annum of LNG in the Abadi FLNG project in the Arafura Sea. The Abadi FLNG is owned 65 percent by Inpex and 35 percent by Shell, though the Indonesian government has control of the production sharing agreement. The new Indonesian onshore project is to be located on Aru Island in order to save on development spending, according to the latest plans from Jakarta. The Indonesians propose that a 370-mile pipeline will be built to connect the Abadi gas field resources to a liquefaction plant on the island. "The company will carefully

examine the contents of the notification, and intends to work closely with the Indonesian government authorities aiming for the early start-up of development," Inpex said. "Going forward, Inpex will openly disclose in a timely manner any developments on this subject," the Japanese company said in its short statement. The Abadi FLNG venture was to have had two production hulls deployed offshore Indonesia, each with about 3.6 MTPA of output capacity and modelled on Shell's Prelude FLNG project offshore Australia. The Japanese company is also developing the Ichthys LNG project in Australia's Northern Territory and which is due for completion at the end of 2017. Ichthys development will deliver gas from the Ichthys field offshore northwest Australia to the onshore facilities at Bladin Point, near Darwin, for processing.

JAPANESE LNG imports of long-term contract and other cargoes edged higher last month for the first time in 2016 in a market reversal in terms of volumes even as prices were more than 43 percent lower on a year-on-year basis. The previous increase in Japan's monthly LNG imports was in August 2015. In the latest figures for March 2016, the shipments amounted to 8.14 million tonnes compared with 8.13MT in March last year, a rise of 0.1 percent compared with the 2015 month and falls of 3.8 percent and 14.1 percent respectively in January and February 2016. The March deliveries also cost 43.7 percent less at 346 billion yen ($3.17Bln) compared 614Bln yen ($5.63Bln) in the year-ago period, according to the preliminary trade statistics from the Ministry of Finance. Fewer cargoes were imported from the Middle East and Asian producers and there appeared to be more deliveries from Australia and Nigeria as well as the spot and short-term markets. This means the average price paid by Japan in March for cargoes was $389 per tonne, or $7.52 per MMBtu, compared with $692 per tonne, or $13.38 per MMBtu, in the year-ago period. The February 2016 price for cargoes was $426 per tonne, or $8.23 per MMBtu, compared with $727 per tonne, or $14.06 per MMBtu, in the year-ago period. The total cost of LNG shipments for the whole of 2015 in dollar terms amounted to $46.6Bln compared with $66.1Bln in 2014. Imports of LNG from the Middle East plunged during last month. Shipments from countries like Qatar, the United Arab Emirates and Oman fell to 2.13MT in March, a drop of 7.8 percent compared with the same month last year. Asian deliveries from nations such as Malaysia and Indonesia, Papua New Guinea and Brunei amounted to 2.52MT, down 2.5 percent. While Russian imports were more than double the total of February 2016 at 784,000 they were still down 7.2 percent compared with the same month of 2015. Imports from other nations such as Australia and Nigeria as well as other producers, including re-exported and spot traded cargoes, accounted for the balance of 2.71MT. On April 11, the government said the price of spot LNG cargoes imported into Japan amounted to $6.00 per MMBtu last month compared with $7.60 per MMBtu in the year-ago period as the worst effects of the oil slump began to level off in the market The differential has now fallen to $1.60 per MMBtu in March 2016 from $3.80 per MMBtu in February. The delivered price in February 2016 was $6.90 per MMBtu compared with $10.70 per MMBtu in the same month of 2015. The levelling off was clearer in the average price of cargoes contracted in February and to be delivered later. The next set of spot prices is published in Tokyo on May 13, 2016.

JORDAN COVE LNG in the US Northwest state of Oregon, recently rejected in the permit process by US regulators for lack of market support, has signed a tolling capacity agreement with one of the largest Japanese trading houses after additionally signing up the Asian nation's two biggest utilities. Veresen Inc., based in the Canadian city of Calgary, said it signed a preliminary 20-year accord on key terms for the purchase by Japanese company, Itochu Corp., of 1.5 million tonnes per annum of natural gas liquefaction capacity at the Jordan Cove plant proposed for Coos Bay in the US state. The Jordan Cove developer has now concluded key commercial terms for at least 3 MTPA of liquefaction tolling capacity. Itochu is among Japan's largest trading companies and in 2010 was behind the formation of the Japan Far East Gas Co., formed by a Japanese consortium to push forward the idea of a new Russian LNG plant in Vladivostok supplying exclusively Japan. Other Japanese companies in the Vladivostok consortium are Marubeni Corp, Inpex and Japan Petroleum Exploration Co. The Vladivostok LNG project will comprise of three liquefaction Trains, each producing around 5 MTPA. The preliminary agreement Itochu has signed with the Jordan Cove project gives the Oregon venture additional fire power when it appeals its rejection by the Federal Energy Regulatory Commission to go with its March 22, 2016 signing of a similar deal with Japan's JERA Co. Inc. JERA is a joint venture between Tokyo Electric Power Co and Chubu Electric, Japan's two largest importers of LNG cargoes. The two have joined forces for power developments and to procure fuel such as LNG under a Japanese deregulation and liberalization of its power industry. Itochu's energy division handles trading of energy products, from crude oil to LNG and electricity as well. The Japanese company is additionally involved in promoting exploration, development and production of oil and gas projects. "This is the second major customer agreement for the Jordan Cove LNG project and it represents further proof of the market support for this project," said Don Althoff, President and Chief Executive of Veresen. "Itochu is a leading global energy company and we are pleased to have them as an additional foundation customer for the Jordan Cove LNG project," Althoff stated. The Jordan Cove LNG project is expected to have an initial design liquefaction capacity of 6 MTPA, or 1 billion cubic feet of natural gas per day. Jordan Cove revealed on March 11, 2016, it had received its rejection notice from the FERC that cited the Pacific Connector Gas Pipeline as the main obstacle to moving forward, as well as the fact it had not signed a supply agreement. The venture has a budget of $6 billion. It completed its environmental impact regulatory process with the FERC on September 30, 2015. The FERC said it was blocking Jordan Cove, firstly because the affiliated pipeline "would bring adverse impacts to landowners and communities. Clearly, we are extremely surprised and disappointed by the FERC decision," Althoff said at the time. The CEO said the Jordan Cove project and Pacific Connector pipeline venture were now the subjects of FERC rehearing requests.

KINDER Morgan, the US pipeline giant and liquefied natural gas project developer, is expanding its fleet of Jones Act product tankers for domestic trading to 16 as it awaits four new product tankers capable of being converted to LNG propulsion. Kinder's four newbuilds of 50,000 deadweight tons are being constructed at the Aker Philadelphia Shipyard. Each LNG-conversion-ready tanker will have a capacity of 337,000 barrels. The vessels will be delivered to Kinder between November 2016 and November 2017. They will be placed in US domestic service, commonly referred to as the Jones Act trade. The first two that are scheduled for delivery, in late 2016 and early 2017, are under long-term contract to a creditworthy oil company. These four new vessels will increase Kinder Jones Act tanker fleet to 16 ships by late 2017, of which 14 are under long-term contracts "with strong, creditworthy counterparties." In addition to ordering ships to operator under tougher emission regulators in the port areas of North America, Kinder is also pursuing its LNG export project on Elba Island, near Savannah, Georgia. The current Elba Island facility is an existing import terminal that will be transformed into a liquefaction plant. Japanese energy and LNG project engineering company, IHI Corp., said on April 5, 2016, that its US subsidiary was awarded the contract to build the liquefaction and export plant for Kinder. The Elba Liquefaction Project will consist of 10 Movable Modular Liquefaction System (MMLS) Trains using the proprietary technology of Royal Dutch Shell. Shell was previously a partner in the project until Kinder agreed in July, 2015, to buy Shell's 49 percent stake in the Elba terminal, leaving the pipeline company with 100 percent of the facility. The new units will connect to Kinder Morgan's existing regasification terminal, which will be modified. Shell will be the customer for 100 percent of the liquefaction capacity and ship-loading services being developed by the project. When completed, the project will process and liquefy a total capacity of around 2.5 million tonnes per annum. While it is just developing its first LNG export project and fueling plans for ships, Kinder is the largest energy infrastructure company in North America with interests in about 84,000 miles of pipelines and 180 terminals. It has the biggest natural gas pipeline network in the US comprising 69,000 miles connected to every US natural gas shale play, including the Eagle Ford, Marcellus, Utica, Haynesville, Fayetteville and Barnett.

LNG LTD, the Australian developer of two North American liquefaction plants in the US state of Louisiana and Nova Scotia in Canada, has named Gregory M. Vesey from US major Chevron Corp. to

replace founder Maurice Brand as Managing Director and Chief Executive based in Houston, Texas. Brand who will continue as an Executive Director of LNG Ltd until his retirement scheduled for June 2017, the company said in a statement to the Australian Securities Exchange, where it is listed. LNG Ltd is developing the medium-scale Magnolia LNG export plant near Lake Charles in Louisiana, the Bear Head project in Nova Scotia, Canada. It also has a site lease agreement in the Australian port of Gladstone for a possible coal-seam-gas-to-LNG venture called the Fisherman's Landing project. Chairman Richard Beresford thanked Brand on behalf of the board, citing his "vision and enormous contribution" as founder. The Australian company said Vasey was bringing "a wealth of experience to this role, most notably through his 35 years with Chevron" in a number of senior executive roles. "Most recently he was President of Chevron Natural Gas and Vice President 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," LNG Ltd said. "After conducting a comprehensive search the board is delighted to announce Greg's appointment," LNG Ltd said. Vesey said 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 enables the company to be successful globally," Vesey said. "I look forward to working with Maurice, the LNGL staff and board, and to meeting our shareholders, strategic partners and current and potential customers in the months ahead," Vesey added. Outside of his Chevron duties, Vesey recently completed a four year term on the board of the Natural Gas Supply Association of America, serving the last two years as Chairman.

LNG LTD. said it received its final permits from the US regulators for the medium-scale Magnolia export venture near Lake Charles, Louisiana. Its authorizations from the US Federal Energy Regulatory Commission open the way to site, construct and operate its facilities. In addition, the Louisiana Department of Environmental Quality approved the air permit for the proposed liquefaction plant. "In a related matter, FERC also authorized the Kinder Morgan Louisiana Pipeline to install compression and other related facilities for the transportation of full feed-gas volumes to the Magnolia LNG project," LNG Ltd said. LNGL new Managing Director and Chief Executive, Greg Vesey, a veteran of Chevron Corp., said: "We are pleased to receive the FERC order and the air permit. Both of these items are important as we progress the Magnolia LNG project towards a final investment decision. We look forward to the US Department of Energy (DOE) processing Magnolia LNG's pending application to export LNG to countries that do not have a free trade agreement (FTA) with the United States." Magnolia's plan is to construct four liquefaction Trains, each with a capacity to produce 2 million tonnes per annum using the company's own patented liquefaction processing technology system called OSMR. "Construction and operation shall include two 160,000 cubic metres capacity full containment storage tanks, ship, barge and truck-loading facilities and supporting infrastructure," LNGL said. The engineering, procurement and construction will be carried out under a lump-sum, turnkey contract awarded to the US-South Korean joint venture of Houston-based KBR Inc. and SK Engineering and Construction. "Our primary focus remains to complete marketing of Magnolia LNG's offtake capacity, finalize financing arrangements, and progress towards construction", stated Vesey.

MITSUI OSK Lines, the Japanese shipping company involved in operating about 70 liquefied natural gas carriers, has established a new LNG management company in Hong Kong called MOL LNG Transport (Asia) Ltd. MOL is becoming involved in managing more LNG carriers in supplying the Asian region as more liquefaction projects come on stream. "As MOL becomes involved in the operation of a growing number of LNG carriers, it intends to play a central role in ship management, particularly in the Asia-Pacific region, to meet an anticipated increase in LNG shipments bound for Asia," the company said. "It continues to take a proactive stance in providing safe, reliable LNG transport services for customers in Japan and overseas, by utilizing the experience, know-how and networks developed as the world's leading LNG carrier owner," said the company headed by President and Chief Executive Junichiro Ikeda. MOL has been instrumental in shipping LNG to Asia from all major producing nations, including Qatar. Its current shipping contracts involve moving more than 6 million tonnes per annum of LNG annually from the Middle East nation to Japan. It also has a comprehensive service contract to deliver LNG for the Sultanate of Oman from its two plants. More recently MOL concluded a basic agreement with ExxonMobil Corp. for the construction and chartering of a small fleet of LNG carriers that trade LNG from Papua New Guinea and Australia to China. "This agreement set the stage for MOL to become the first non-Chinese shipping company involved in China's LNG market," the Japanese company pointed out. Additionally MOL has a contract involving the shipping of LNG for Chinese energy company Sinopec. It will also play a role in operating ice-class LNG carriers to ply Arctic Ocean routes to transport LNG from Russia's Yamal LNG project from 2018.

OLT OFFSHORE LNG Toscana, the Italian company that owns the floating import facility deployed offshore the Mediterranean coast, said 12 different companies presented offers in its tender for cargoes and it had allocated five delivery slots. The total quantity of LNG to be delivered under the tender for "the regasification and storage bundled service for the 2016-2017 storage year" is around 325,600 tonnes, the equivalent of 440 million cubic metres of natural gas. The regasified LNG will be sent into the system of Stoccaggi Gas Italia, the storage unit of the Snam Rete Gas company. The "FSRU Toscana", moored about 22 kilometres off the coast between the cities of Livorno and Pisa, is connected to the Italian national gas transmission network grid through a 36.5km pipeline from the shore to the mainland. "Taking into account the operational limits in the injection phase of the natural gas in the storage, it was possible to allocate five slots," OLT said. "One is in the month of June, two in July and two in August," the company said. "OLT is particularly pleased with the outcome of the tender. This represents a result which can be interpreted positively both in terms of market recovery and as the progressive accreditation of the plant in the LNG chain. Furthermore, we are happy to be able to participate at this measure and thereby contribute to the security of energy supplies in Italy," the company stated. The peak-shaving service is one of the emergency measures established by decree by Italy's Ministry of the Economic Development as part of its "emergency plan" to provide back-up to the national gas system. The use of a European LNG import terminal as a peak-shaving facility serves to highlight the lack of LNG and natural gas demand in Europe. At full capacity, the OLT terminal can regasify 3.75 billion cubic metres per annum of natural gas, the equivalent of 2.77 million tonnes a year of LNG, or around 4 percent of Italy's annual needs. The Italian FLNG import facility was developed by Germany's E.ON Group, now known as Uniper, Italy's Iren and Golar LNG. The Toscana terminal is one of three operated by Italy. A second is the onshore and long-established Panigaglia terminal near Genoa, in operation since 1969. It is owned by Snam Rete. Italy's third import facility is the Porto Levante offshore gravity based structure, known as Adriatic LNG. It has been in operation on the east coast since 2009 and its shareholders are Qatar Petroleum, ExxonMobil and Edison Gas.

PORTUGAL became the first European country to receive a US LNG cargo from the export plant owned by Cheniere Energy that recently went into operation at Sabine Pass in Louisiana. The Portuguese import terminal at Sines received the shipment on April 26 from the 174,000 cubic metres capacity carrier "Creole Spirit", one of the newest additions to the global LNG fleet. The Bahamas-flagged "Creole Spirit" lifted the sixth cargo 12 days earlier from Cheniere's facility, where one processing Train is currently operating and five more are being constructed. The vessel that carried the cargo to Portugal is Teekay's LNG's first electronically-controlled, gas-injection (MEGI)-type carrier that was passed to Sabine Pass owner Cheniere on a long-term charter on February 26, 2016. The two-stroke MEGI engine technology is provided by Germany's MAN Diesel and is said to be more fuel efficient than other systems. The first Sabine Pass cargo was delivered to Brazil in February and others have been shipped to South America, including Argentina and Brazil, and one has gone to India. The six Trains at Sabine Pass when completed will each have a nameplate capacity of 4.5 million tonnes per annum of LNG for 27 MTPA in total production. Up until now, Portugal has relied on LNG imports mainly from Nigeria, Trinidad and Norway for about a third of its natural gas. Portugal's LNG imports last year totalled a modest 1.09 million tonnes, while neighbour Spain, with seven regas terminals, imported 8.82MT.

RASGAS of Qatar, one of the key Middle East players in the liquefied natural gas market, told the LNG 18 conference in the Australian city of Perth that demand for the fuel would continue to spread globally at its recent robust rate. RasGas cautioned, however, that the sector must continue to be underpinned by long-term and significant capital investments in production, liquefaction and transportation, rather than be unduly influenced by the current increase in spot pricing trading levels and shorter supply

Diary of events

June

The 11th Annual Conference FLNG 2016
June 6 – 9, 2016
Hyatt Regency - The Churchill
London, UK
www.icbi-events.com

14th World LNG Series: Americas Summit & Exhibition
June 7-10, 2016
Houston, Texas
USA
www.lngamericas.cwclng.com

APPEA Conference & Exhibition 2016,
June 5-8, 2016,
Brisbane Convention and Exhibition Centre, Brisbane,
Australia
www.appea.com.au/event

November

European Autumn Gas Conference
Nov 15-17, 2016
World Forum, The Hague
The Netherlands
www.theeagc.com/

contracts. Only a long-term focus and strategy RasGas said, would allow a truly global LNG energy business to emerge. RasGas and affiliated company Qatargas have 14 LNG Trains in production, including six of the world's largest, enabling Qatar to produce 77 MTPA. Of this total, Qatargas has 43 MTPA of deliveries to make and RasGas produces around 37 MTPA for its customers The company's market overview has been offered by Hamad Mubarak Al-Muhannadi, the Chief Executive of Rasgas, which in addition to operating seven LNG Trains in Ras Laffan has a contracted worldwide fleet of 27 LNG tankers. Addressing conference delegates, Al-Muhannadi said there was no more testament to the potential growth of LNG worldwide than the fact that today there were 30 countries importing LNG - twice the number of just 10 years ago. RasGas supplies long-term customers such as Taiwan and the rising Asian regasification power, India. "The liquefied natural gas landscape has evolved considerably over the past decade and promises further changes in the years to come," said Al-Muhannadi. "We anticipate that the pace of growth will continue and more countries will be importing LNG in the next decade," he said. "Through these cycles though, which are part of the global market for LNG continuing to evolve, it is still a business requiring significant capital investments in production, liquefaction and transportation. As such, the LNG sector requires safe and reliable suppliers with long-term visions," the RasGas CEO stated. LNG operators also require the resilience to overcome short-term uncertainty, and "the corporate strength to meet customer needs."

SANTOS, the Australian energy company said the three liquefied natural gas plants where it has stakes, the Gladstone coal-seam-gas-to-LNG joint venture in Queensland, the Darwin LNG plant and the Papua New Guinea project delivered a total of 56 cargoes in the first quarter. Santos said the Gladstone LNG plant, which recently started commercial operations on Curtis Island in Queensland after costing US$18.5 billion to build, produced 958,000 tonnes of LNG

and shipped 16 cargoes in the first three months of the year. The Australian company said sales under the long-term contracts with GLNG's foundation customers started at the end of March. During the quarter, PNG LNG operated by ExxonMobil, shipped 26 LNG cargoes, taking the total to 182 cargoes since the plant's start-up in May, 2014. The ConocoPhillips-run Darwin plant in Australia's Northern Territory delivered 14 LNG cargoes to Asian customers. Santos said the average LNG price it received for shipments from all three plant stakes in the first quarter was US$6.24 per million British thermal units compared with $12.33 per MMBtu in the same three months of 2015. Total quarterly sales revenue from its share of LNG cargoes at GLNG, PNG LNG and Darwin LNG amounted to A$301 million (US$233M) compared with A$276M (US$203M) in the 2015 quarter, with new production coming from GLNG at lower prices. The Adelaide, South Australia-based company also has natural gas and oil interests. Total natural gas and LNG sales revenue increased 16 percent to A$602 million (US$466M) for the quarter. Santos, which assumed US$9 billion in debt to cover its stakes in the GLNG LNG and PNG LNG joint ventures has been particularly hard hit by the oil price slump. Santos said commissioning work on the second LNG Train at GLNG was progressing well. "First gas was introduced into the front end of the Train in April. All six refrigerant compressors have been run and the wet flare, dry flare and fuel gas systems are operational. First LNG is expected in the second quarter of 2016," Santos said. The new Santos Chief Executive Kevin Gallagher, who took over the helm on February 1, said the company's first-quarter results reflected solid production and a firm commitment to drive costs down and improve efficiencies. "We are focused on developing a business that is self-sustaining in a low oil price environment and well positioned to take full advantage of rising commodity prices in the future. We will continue to look for opportunities to lift productivity and reduce costs to drive long-term value for shareholders," Gallagher said. Santos produced 15.6 million barrels of oil equivalent in the first quarter of 2016, up 11 per cent from the same three months last year. Santos maintained its annual production guidance of 57-63 million barrels. On April 11, Santos announced that Gallagher had just made six executive changes and described the move as a "key step in establishing a new operating model for Santos." The model is focused on "both lifting productivity and driving long-term value for shareholders in a low oil price environment."

SINGAPORE's Energy Market Authority (EMA) regulator has extended until May 27 a tender for a feasibility study on using floating liquefied natural gas import facilities for the city state as it builds up its infrastructure and trading as a regional hub. The regulator has already singled out two sites where Floating Storage and Regasification Units can be berthed, either at a quayside or offshore. Singapore has placed its tender documents on a government e-procurement portal called GeBiz and urging consultants to put forward their bids. The tender document said the floating solutions are to be used either as permanent infrastructure to meet Singapore's growing gas demand or as a "quick-to-deploy" option that can be activated at short notice to increase the country's LNG import capability. This could mean greater gas capacity for Singapore, in addition to the existing onshore LNG terminal on Jurong Island. The terminal began operations in May 2013 and will be expanded from the current capacity to import 6 million tonnes per annum to 11 MTPA by 2018. Plans for a second onshore terminal are also being examined. The EMA noted in the FSRU feasibility tender offering that the consultants should also suggest assessment criteria that would allow it to determine if more potential sites should be studied. The tender had initially been scheduled to close on April 20. The EMA and the government are actively encouraging the growth of LNG as a clean fuel for Singapore and the Asian region. The Jurong Island terminal has already been offering expanded services to encourage the fuel's use. These services include offering storage and reloads of cargoes, allowing carriers to berth at the facility to unload a cargo and store it for a period of time. It also offers LNG carriers cool-down facilities. This means newly-built vessels, those fresh out of dry-dock or completely emptied of their previous discharge can have their storage tanks cooled from ambient to cryogenic temperatures, before loading their next cargo. The current facility consists of two jetties that handle the largest LNG carriers, three LNG storage tanks of 180,000 cubic metres capacity and regasification equipment. In addition to LNG, Singapore currently imports the equivalent of around 7 MTPA of pipeline natural gas for its domestic use. The EMA also plans to allow imports of spot LNG for domestic use after the conclusion of an exclusive supply franchise held by the UK's BG Group, now part of Royal Dutch Shell. It was currently reviewing its policy to provide natural gas and LNG buyers with more flexibility. The regulator has short-listed three companies, Pavilion Gas, Sembcorp Industries and Shell, to supply 3 million tonnes per annum of LNG to the city state. As part of the LNG and natural gas hub developments, the Singapore Exchange (SGX) has offered financial derivatives since February 2016 in the form of futures and swaps linked to its weekly index of spot prices for LNG in the Asian market. Final settlement for the SGX contracts is determined by average weekly assessments gathered from producers, consumers and traders in the physical LNG market. Singapore is already the trading base for more than 25 of the leading energy trading companies, including the US and European energy majors and LNG producers and regional suppliers. While the SGX has the financial and trading infrastructure to become an LNG hub, Singapore itself does not yet have the physical capacity of LNG to underpin its markets. The SGX LNG derivative market is in its early stages and the majority of transactions and contracts are traded over the counter and cleared by SGX.

STENA LINE of Sweden, one of Europe's leading ferry companies with 35 vessels and 22 routes in Northern Europe, has ordered four liquefied natural gas-ready ferries with options for four others from the AVIC Shipyard in China. The vessels will be able to accommodate about 1,000 passengers, vehicles and freight trucks the ships' engines will be "gas ready", prepared to be fueled by either methanol or LNG. Stena, based in Gothenburg, said the contracts for the "RoPax" ferries will see deliveries begin in 2019 and 2020. The intention is that the four initial vessels will be used within Stena's route network in Northern Europe. "We are very pleased that Stena have signed a contract for four vessels with an option for another four from the Chinese shipyard based in Shanghai. During the course of the past 24 months our engineering staff has managed to develop a design that is not only 50 percent larger than today's standard RoPax vessels, but more importantly, incorporates the emission reduction and efficiency initiatives that have been developed throughout the Stena Group during the past years," said Carl-Johan Hagman, Managing Director of Stena. "These ships will be the most fuel efficient ferries in the world and will set a new industry standard when it comes to operational performance, emissions and cost competitiveness, positioning Stena Line to support its customers in the next decades," added Hagman. "With this investment we are building on our successful RoPax concept mixing freight and passengers. Through standardization we secure a reliable operation and through flexibility we can provide an even better support to our customers and help them to grow," stated Hagman. Dan Sten Olsson, Chairman of Stena Line, said the company foresaw a continued demand growth for short sea services in Northern Europe and in many other parts of the world. "Ferry transportation will play an essential part in shaping tomorrow's logistics infrastructure if we are to have sustainable societies," Olsson said. "Not only is transportation on sea the most environmentally efficient way of moving goods, it is also infrastructure that provides reliable and speedy logistics with very limited public cost," the Stena Chairman added.

TEXAS LNG Brownsville, the medium-scale export project located on the Gulf Coast, has filed its permit requests with US regulators for a liquefaction plant to be built in two phases and to produce 4 million tonnes per annum by 2020. The filing with the US Federal Energy Regulatory Commission was revealed by LNG and gas industry veteran and company founder Vivek Chandra. "Transitioning from the pre-filing to the formal application stage is significant, placing Texas LNG within a select and elite group of US LNG export projects in the FERC formal filing process, bringing us closer to our goal of delivering low-cost LNG under flexible terms from the Port of Brownsville to global buyers in 2020," Chandra said. Texas LNG plans to begin construction of Phase 1 of the project before the end of 2017. The Texas project is one of several proposed export projects located along the Brownsville Ship Channel. Of the current ventures, two others have been accepted into the FERC's pre-filing program. They are

Annova LNG with plans to produce 6 MTPA and the Rio Grande LNG project targeting 27 MTPA of output. Texas LNG submitted its request to initiate the FERC pre-filing process in March 2015. During the past year, Texas LNG and its team of technical, environmental and legal advisers have completed front-end engineering and design, submitted draft resource reports covering a wide range of areas including engineering, reliability and safety. They have also engaged in extensive consultations with FERC and other federal and state agencies, including the US Fish and Wildlife Service, US Army Corps of Engineers, US Coast Guard and the Texas Commission on Environmental Quality. Langtry Meyer, a co-founder and Chief Operating Officer of Texas LNG, said: "The filing of Texas LNG's application to FERC represents the culmination of over 300,000 man-hours and 12 months of rigorous effort and engagement with FERC and other government agencies by the entire Texas LNG team." Texas LNG said it continued to believe that "smaller independent projects that promise low cost, low technical risks, and offer transparent, flexible tolling terms" will be best placed in the current global market. Texas LNG anticipates receiving all approvals and reaching a final investment decision in 2017.

UNITED ARAB Shipping Co., Royal Dutch Shell and the world's largest liquefied natural gas producer, Qatargas, have signed an agreement to jointly study projects related to the development of LNG as a marine fuel in the Middle East region. UASC owns and operates a fleet of 60 ships and intends to eventually use LNG as a fuel for its 17 newbuild container vessels. The memorandum of understanding (MoU) was signed at a ceremony attended by Qatargas Chief Executive Officer, Khalid bin Khalifa Al Thani, UASC Chief Executive, Jorn Hinge and Managing Director and Chairman of Qatar Shell Companies, Michiel Kool. The three companies said they will explore new markets for LNG to be used as propulsion fuel and the possible conversion of UASC's existing vessels, providing them with the opportunity to use a cleaner fuel as Emission Control Areas are created in Europe, North America and beyond. "The MoU envisages LNG supplies for this pioneering initiative to be made available from Qatargas 4, a joint venture between Qatar Petroleum and Shell Gas, with United Arab Shipping Company Line potentially using the fuel for its recently built container ships," they said. Saad Sherida Al Kaabi, Chairman of Qatargas, said: "LNG as a marine fuel is gaining momentum in the deep sea transportation industry as the best alternative to meeting increasing environmental standards." Khalid bin Khalifa Al-Thani, Qatargas Chief Executive, said he was pleased to be a partner of Shell in this venture. "LNG as a transportation fuel is growing and we with our partners believe we have the people, tools and resources to make it a reality," said Al-Thani. "Through this effort we know we can make a significant impact on how the shipping industry evolves over the next generation. We see this as our opportunity to support the international efforts to reduce greenhouse emissions and create a cleaner environment for future generations," the Qatargas CEO stated. Jorn Hinge, UASC Group CEO, said UASC, with Shell and Qatargas, was fully committed to environmental sustainability and developing LNG as a marine fuel. UASC has its headquarters in Kuwait City, though has other offices, including one in London and in other cities worldwide. "As part of our newbuilding programme, UASC has received 13 of 17 new vessels over the past 16 months, seven 15,000 twenty-foot equivalent unit (TEU) vessels and six 18,800 TEU ultra-large container vessels," Hing said. "We are due to take delivery of a further four 15,000 TEU vessels in the coming months. These ships are the greenest in the world and uniquely LNG-ready, meaning once the infrastructure is ready globally, with a quick and cost-efficient retrofit, they can run on LNG and become even more eco-friendly," Hing explained. Michiel Kool, managing director of Qatar Shell Companies, said: "Shell is delighted to work in partnership with Qatargas and UASC to create new market development opportunities for the use of LNG as a marine fuel in the Middle East region from its Qatargas 4 joint venture. Shell has been a pioneer in this area with our investments in LNG for transport infrastructure in Europe and the US, and we look forward to now deploying our expertise to create a regional hub in the Middle East in collaboration with two very strong global partners."

US ENERGY companies and liquefied natural gas project developers have hailed the passing by the Senate of a bill that will make it easier to build liquefaction and export plants and other natural gas and oil infrastructure nationwide. The US Center for Liquefied Natural Gas, the US industry's Washington DC-based lobbying group, said it was delighted with the passing by the Senate of the "The Energy Policy Modernization Act" by a vote of 85-12. Among other issues, the bill brings greater regulatory certainty to US LNG projects by requiring that the Department of Energy makes a permit decision within 45 days of an export project's completion of the environmental review. The bipartisan bill will now be will now be merged with "The North American Energy Security and Infrastructure Act. After CLNG first initiated the call for legislation in the last Congress, the vote represents a watershed moment for the US LNG industry," said Charlie Riedl, CLNG Executive Director. "The crucial point about this legislation, and indeed the bill that passed the House last year, is that it will provide the industry with confidence in the regulatory process. Project developers should know that they have a rock-solid timeframe to work with, and that certainty is crucial for these large, complex, capital-intensive investments in the US economy. This legislation will help catalyze the fast-maturing domestic LNG industry," Riedl added. "As the leading industry voice on this issue, CLNG thanks allies and bipartisan leadership in the Senate, especially Senators Lisa Murkowski and Maria Cantwell, for their efforts. The vote is a big step forward, and we hope LNG exports will continue to receive bipartisan support as it advances in the legislative process," Riedl stated. The American Gas Association said the US Senate's action would benefit natural gas customers throughout the nation. "The bipartisan energy legislation passed by the Senate contains provisions that promote strategic use of our nation's natural resources," said AGA President and Chief Executive Dave McCurdy. "Natural gas utilities have been supportive of this legislation through its many stages and worked with the energy efficiency community and other allies to strengthen the bill along the way," McCurdy added.

WOOD GROUP, the UK energy services company, has acquired Australian firm SVT Engineering Consultants with a client base covering the onshore and offshore oil and gas market, including LNG, as well as other sectors. SVT, a privately-owned company with headquarters in Perth, Western Australia, provides piping and rotating equipment vibration, noise, integrity engineering and asset integrity services. The value of the transaction was not disclosed. The company was formed to pioneer the application of sound and vibration technology in the Australian resource sector. Wood Group, based in Aberdeen and listed on the London Stock Exchange, said current Managing Director Stewart Wharton would continue to lead the 110-strong team of personnel across SVT's offices in Perth and Brisbane. SVT will operate within the Wood Group Kenny business. "SVT further expands the global technical expertise, which Wood Group established with the acquisition of Calgary-based BETA Machinery Analysis in June 2015. The acquisition also enhances the geographic footprint of Wood Group, making it a truly global offering," the UK company said. "Australia is one of the world's largest producers and exporters of minerals and is on the cusp of becoming the world's largest LNG producer," said Bob MacDonald, Chief Executive of Wood Group Kenny. "SVT builds on our asset integrity management service line as part of our strategy to enhance our vibration, dynamics and noise capability to support the operational phase of Australia's LNG and mining infrastructure for decades to come," MacDonald added. "SVT is a natural strategic fit augmenting, yet broadening, our existing spectrum of specialist technical services to the energy, industrial and renewable markets, where we have an industry leading capability," he said. The acquired company's MD Wharton said: "Joining Wood Group means we can offer our specialist services to an enhanced global client base and we look forward to being part of the company's international network. We are focused on solving difficult problems in the oil and gas, mining and utilities sectors and we share Wood Group's culture and values which strongly emphasize safety."

WOODSIDE ENERGY Trading Singapore, a unit of the largest Australian LNG producer, has signed a Heads of Agreement with Indonesian energy company Pertamina for the supply of up to 1 million tonnes of LNG per annum. The volumes would come from Woodside's LNG portfolio for a period of 15 to 20 years and starting in 2019. Woodside,

which operates the North West Shelf venture in Western Australia as well as the nearby Pluto LNG plant, will purchase 850,000 tonnes per annum of cargoes from Train 2 at the Texas plant when it is built. Indonesia is itself a major LNG exporter with two liquefaction plants and supplying countries such as Japan and China. It is also setting up a network of regasification facilities to supply its own domestic market with cargoes as demand grows from industry and power companies. While Indonesia is building regasification facilities to boost natural gas supplies, Woodside is hoping to expand its LNG production from after 2020 to help supply the Asia-Pacific region. The coming on stream of the Donggi-Senoro plant gave Indonesia three operating production facilities. In addition to the large Bontang complex in East Kalimantan and the BP-operated Tangguh facility in West Papua, Australian-listed Energy World Corp. has almost completed its Sengkang LNG plant in south Sulawesi, though it will mostly initially satisfy local power needs. The Japan-led Donggi-Senoro venture is a small-scale operation compared with the multi-Train Bontang complex. Bontang produces more than 10 MTPA while the Tangguh LNG plant opened in 2008 with two Trains and 7.6 MTPA of production and a third Train planned. "This HOA remains conditional upon the negotiation and execution of a fully termed LNG sales and purchase agreement and obtaining all necessary approvals (including the relevant Woodside and Pertamina board approvals)," Woodside said in a statement. Pertamina on July 1, 2014, also signed up for more Texas cargoes from the US export project at Corpus Christi being developed by Houston-based Cheniere Energy. Pertamina agreed to purchase a further 760,000 tonnes from the second Train of the proposed US plant, doubling its offtake to a total of 1.52 MTPA after an earlier deal. The US cargoes were sold on a free-on-board basis and similarly priced to the Pertamina volumes at about 113 percent of Henry Hub.

WOODSIDE Chief Executive Peter Coleman told the shareholders in Australia's largest liquefied natural gas operator that he remained committed to the development of the offshore Browse field as a floating LNG venture was advancing other projects including in North America. "You will be aware that we took a tough decision in March not to progress with the Browse FLNG Development at this time. I want to assure you all today that Woodside remains committed to the earliest commercial development of the world-class Browse resource and to FLNG as the preferred solution, but the economic environment is not supportive of a major LNG investment at this time," the CEO said. Coleman told the Woodside annual general meeting that the addition of Wheatstone LNG in Western Australia and Canadian Kitimat LNG interests last year from Apache Corp. increased the company's contingent resources by 151 per cent. "The Wheatstone Project joint venture is targeting first LNG in mid-2017. We're confident in the long-term value of this project. When operating, Wheatstone will generate significant long-term returns for Woodside shareholders," he said. Coleman said the Woodside-operated Julimar gas field project remained on target to achieve start-up on budget and schedule in the second half of this year. "I remain positive about our development opportunities in Canada," Coleman stated. "The joint venture (with Chevron) has drilled some appraisal wells in Kitimat. The initial production rates are very encouraging and confirm that the Liard Basin in British Columbia is a truly world-class resource," he added. "We accelerated our efforts in technology and innovation in order to drive down our cost base over the next two to three years. We want to be positioned for final investment decisions that ideally provide LNG supply in the early to mid-2020s to meet what we believe will be renewed market demand," the CEO said. "Along these lines, we're pursuing the next generation of modular construction techniques. We've also introduced data analytics and a cognitive computing system, allowing us easier access to 30 years of Woodside knowledge and enabling industry-leading, data-driven decision making," Coleman explained. "To sum up, we're an experienced, reliable operator, and we are evolving as the world demands it. I think we've aptly demonstrated in 2015 that we have a robust and resilient model, albeit one which is adaptable given the challenges of this lower oil price environment. We'll continue to seek growth opportunities, making disciplined decisions about what we choose to pursue and when," he said.

WOODSIDE posted an almost 31 percent plunge in liquefied natural gas revenue in the third quarter to US$727.4 million from $1.05 billion in the same three months a year ago. Woodside said 60 cargoes were delivered to Asia from the Northwest Shelf plant it shares with five other companies, while its 90-percent owned Pluto LNG facility exported 18 shipments. The North West Shelf shipments were five fewer than the same quarter a year ago and Pluto's cargoes were up by one. Woodside's first-quarter revenue from LNG at the North West Shelf was US$211.4 from its one-sixth share compared with US$342.8, a fall of 38.2 percent. Its Pluto LNG revenue was US$516M compared with US$712M in the same three months of 2015, down 27.5 percent. Woodside Chief Executive Peter Coleman said the company was progressing well with its low-cost, high-value growth strategy. "We are taking advantage of market conditions and applying latest technology to reduce life-cycle costs further enhancing our position as a low-cost operator. This will also improve project concepts to deliver a portfolio of globally competitive decision-ready projects," he said. The company listed six big quarterly highlights that will have a long-term impact, including the postponement of the Browse floating LNG project, offset by a project development agreement with US energy company and California utility, Sempra, to continue assessments of a potential 10 million tonnes per annum project in Port Arthur, Texas. Woodside listed the other positives as its natural gas discovery in the Thalin-1A exploration well, located offshore Myanmar. It also achieved an annualized loaded LNG production rate equivalent of 4.8 million tonnes per annum at the Pluto LNG plant in northwest Australia compared with the 4.3 MTPA nameplate capacity. On the financial front, Woodside was heartened by its existing credit ratings being affirmed by US agencies Moody's and Standard & Poor's. The company and its five partners in the North West Shelf LNG export venture at Karratha said they entered a front-end engineering and design phase for the Equus project to process third-party gas resources. While the Browse FLNG venture was temporarily on the back burner, Woodside said it was still advancing with the Kitimat LNG project in British Columbia, Canada, in which it is a shareholder with Chevron Corp. "Appraisal work on the Liard basin continued to underpin reservoir potential," Woodside said. "The second development scale appraisal well was brought into production during the quarter and the early results are above expectations. The project is continuing to progress through the concept select phase," the Australian company stated. In other activities, Woodside said that during the quarter the "Woodside Chaney", a 174,000 cubic metres capacity LNG carrier, commenced its charter to Woodside. "The ship will be used to support trading activities as well as underpinning long-term supply from our global portfolio," it said.

WOODSIDE has signed a five-year charter contract with Norwegian company Siem Offshore to provide the Asia-Pacific nation with its first LNG-powered marine support vessel in 2017. The announcement was made at the LNG 18 conference in Perth, Western Australia, where Woodside is based. Woodside Chief Operations Officer Mike Utsler said the move positioned the company as an early adopter of LNG as a marine fuel in the region. "We're thrilled to be the first company to bring one of these vessels to the southern hemisphere," Utsler stated. "Australia is on track to become the world's largest producer of LNG, so it makes perfect sense to build dual-fuel capabilities for our marine fleets here," he added. Woodside operates two LNG export plants in Western Australia, delivering to Asian nations, and is also widening its LNG and exportation and production activities to North America and Africa. "Our LNG tankers use their cargo to power their engines, making them cleaner vessels that use less diesel. It's natural that we progress this capability through to our support vessels," he explained. Woodside said its new vessel chartered from the Kristiansand-based Norwegian company would provide reliable support to the company's assets in the Exmouth and Pilbara regions of offshore Western and Northwest Australia. Woodside said it would seek to expand the application of LNG-fueling in transportation in Western Australia. "Dual-fuel has an exciting future as it can be used to power a wide range of vessels," the Australian company said. The current fleet of Norway's Siem Offshore fleet consists of 54 vessels with focus on low fuel consumption and eight of these are under construction. The Siem fleet also includes large anchor-handling tug supply vessels, platform supply vessels and offshore subsea project ships designed to meet challenging environments. ■

BRAEMAR ENGINEERING

Braemar Engineering is involved in the LNG value chain from natural gas liquefaction all the way down to LNG distribution to the end-user. With on-shore and marine LNG specialists, Braemar Engineering provides Owner's engineering services for LNG plants, LNG terminals, LNG shipping, LNG bunkering and LNG as marine fuel.

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Australia finishing off CSG-to-LNG plants and they will produce 8 percent of global supply

Project engineers and executives explain pride at completion of Curtis Island ventures

Australia's organizing of the LNG 18 conference brought to the fore the huge achieved in developing three coal-seam-gas-to-LNG projects alongside each other on Curtis Island, off the coast of Gladstone, Queensland.

Experts from the Queensland Curtis LNG project, the Gladstone LNG and Australia Pacific LNG spoke about the ventures, all of which are now in production.

Overview

Key among the speakers was a man with overall responsibility for the three, Alasdair Cathcart, General Manager of LNG and a Vice President at Bechtel Oil, Gas and Chemicals, who presented a paper on "Successfully Delivering the Curtis Island LNG Projects".

"In quick succession, each customer hired Bechtel to design and execute their project on a lump-sum basis.

"The three island projects are located side-by-side and are only accessible by water, presenting a unique set of challenges and opportunities.

"These simultaneous construction programs are part of the largest concentration of private-capital investment in Australia's history," Cathcart stated.

The Bechtel paper discussed the company's experience in modular design of the ConocoPhillips Optimized Cascade process technology and its programme for successfully delivering these projects by a direct-hire approach.

"Each project optimized the extent of modularization through construction-led engineering and employed a unique execution approach in collaboration with fabrication yards.

Efficient

"Each plant design is based on highly efficient aero-derivative gas turbines with power augmentation for refrigeration compressor drivers," he said.

"Highly efficient nitrogen rejection units minimize the environmental impact and safety hazards, while maximizing the performance, flexibility and ease of modularization," the presentation noted.

Cathcart said to execute effectively multiple projects on the island, a centralized service strategy was adopted for standardization, knowledge sharing and alignment with customers, regulators and the community.

However, the APLNG project partners, including ConocoPhillips, said they were initially "disappointed" with some elements of the Queensland project's early development, but in the end these turned out to be advantageous, according to the project company Chief Executive Page Maxson.

APLNG's disappointment stemmed from being allocated a site on Curtis Island that was farthest up the Gladstone harbour.

Dredging

Maxson said this location called for more dredging, and there were no earthworks.

"However, it turned out that the site was spacious, giving scope for productivity enhancements once construction began," said Maxson.

Another early challenge was having to move the marine embarkation terminal nearer the other two, QCLNG and GLNG.

Maxson said that, despite initial disappointment, the move actually turned out to be a significant advantage.

"One more situation that arose was when the state government asked APLNG to consider the delivery of utilities from the mainland," Maxson said.

Advantages

The project owners initially rejected the idea as "unacceptably expensive" but then re-examined it and uncovered a different approach to bringing utilities from the mainland that provided significant cost savings.

Maxson also spoke about the advantages of being the third LNG project behind BG Group's QCLNG and the Santos-run GLNG venture.

"Being third provided numerous opportunities to adjust when issues were experienced by the other two," while APLNG was "more fully defined before execution", he said.

Maxson also paid tribute to the state and federal governments.

"We owe a lot of our success in Queensland to the fact that both political parties and at the federal level decided they supported the (CSG-to-LNG) industry and took steps to create the environment for us to do it," he said.

"It would have been difficult to achieve in an antagonistic relationship with the government."

Having an "open and collaborative relationship" with main contractor Bechtel and other contractors was also a benefit.

Maxson said there were three or four issues during construction that could have led to major delays and or cost overruns.

However, on each occasion, having close working relationships with the contractors meant these serious issues were resolved.

The APLNG joint venture partners ConocoPhillips, Origin Energy and Sinopec exported their first cargo of LNG on January 9, 2016.

The project comprises two LNG Trains, each with the capacity to deliver 4.5 million tonnes per annum of LNG.

The second Train will start production in the second half of 2016.

GLNG June target

Additionally, Australian energy company Santos is on track to deliver the first cargo from Train 2 at GLNG by the end of June 2016.

Santos started production from Train 1 at the CSG-to-LNG plant at the end of last year, with an initial shipment to South Korea.

Vice president of downstream for GLNG, Rod Duke, said during his GLNG project presentation at LNG 18: "We are very confident that we will produce our first LNG from Train 2 before the middle of this year."

The US$18 billion, two-Train project has nameplate capacity of 7.8 MTPA. Santos operates GLNG with a 30 percent interest and its partners are Malaysia's Petronas and France's Total with 27.5 percent each and Korea Gas Corp. with 15 percent.

Both Petronas and Kogas are off-takers as well as upstream investors in the project.

GLNG is Santos's first operated LNG project and, Duke said, the largest single project ever undertaken by the company.

Technology

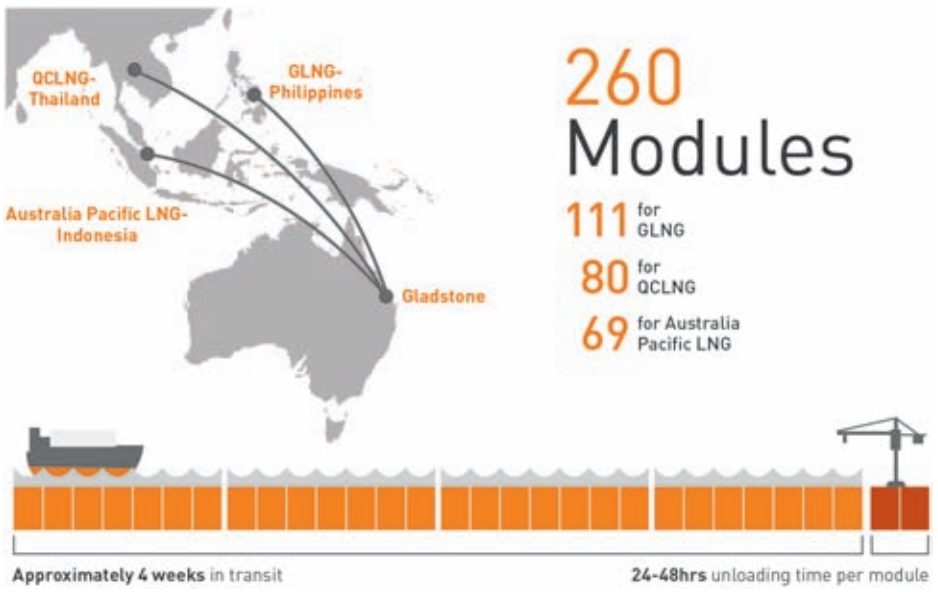
"We made extensive use of technology. In fact, we control an entire field operation from the seventeenth floor of our office," he said.

"We have 35 people running 800 CSG wells. They are busy, but it has certainly made it a more efficient operation.

"We think that this is the way of the future and in fact we are looking to improve and expand on this approach," Duke said.

The GLNG executive also said the CSG feed-gas for LNG was something Santos was "still learning about and getting better at," even as its CSG field experience stretches back more than 20 years.

QCLNG was the first project to come on stream and Royal Dutch Shell is now the majority shareholder after its BG



Modular building of LNG plants reaches a probable peak. Three plants are unlikely again to be built simultaneously at same location

takeover. Also in that joint venture are China National Offshore Oil Corp and Japanese utility Tokyo Gas.

In December 2014, QCLNG became the world's first producer of LNG from natural gas sourced from CSG.

Performance

"The QCLNG project has both trains operating and performing at high levels. The project is complete and the custody of the plant has been transferred to the owner," Bechtel's Cathcart said in his report.

The first trains of the GLNG and APLNG projects are running and loading cargoes. The performance test for GLNG is complete, with excellent results.

The second trains of the GLNG and APLNG projects are planned to be completed in 2016.

"The start of LNG production from these projects is a result of nearly five years of development and construction on Curtis Island.

"As the EPC contractor, Bechtel designed the plants, procured monumental quantities of materials from more than 100 global suppliers, built modules at three yards in Asia, provided support services in Gladstone, as well as performed

Three island projects are located side-by-side and only accessible by water

construction at Curtis Island sites.

"The three projects together required over 14,000 personnel, with 6,600 living on Curtis Island," the report said.

Volumes

Together, the three Curtis Island plants, when Trains are completed, will account for over 25 MTPA of LNG capacity, roughly 8 percent of global production.

"Due to overlapping schedules, close proximity, and good cooperation, each project and all customers have benefited from economies of scale and efficiency orchestrated by Bechtel," Cathcart said.

"Bechtel engineers in Houston and Shanghai geared their designs for the three Curtis Island plants to modular construction, enabling simultaneous construction at multiple sites, allowing for a fast-tracked schedule and access to skilled and experienced resources.

"At Bechtel facilities in the Philippines, Indonesia, and Thailand, teams built 260 modules weighing 125,000 metric tonnes for use in all three complexes," his report said.

"Success of the Curtis Island LNG projects is a tribute to many organizations working collaboratively, namely the owners, Bechtel, ConocoPhillips, suppliers, and the Gladstone community," the Bechtel report said.

"In addition to successfully building these plants, the projects demonstrated their strong commitment to local environmental, community relations stewardship, and the development of local people and business.

"As a consequence, these projects will leave a positive legacy both for the owners and the community," it stated. ■

Canada looks to advance with natural gas and LNG outlook that is more positive for projects

Sleeping giant of North American energy resources may not heed wake-up call for now

Some market observers have suggested that Canada is more likely to start exporting liquefied natural gas in the 2030s as LNG producers in countries like the US, Russia and Australia are well positioned to meet global demand until then.

The Canadian National Energy Board made this point in a report entitled "Canada's Energy Future 2016" that included predictions on the future of Canada's mostly stalled LNG export projects.

Reliance

It also included detailed points on Canadian natural gas production that is relying on LNG export ventures moving forward as pipeline exports to the US continue to drop.

The Board forecasts that the country's natural gas production will increase through the next decade, though exports by pipeline to the United States are expected to continue to decline and Canada will rely on sending LNG exports to Asia by 2019 or thereafter.

It expects that Canadian natural gas net exports to the US will fall to 2.5 billion cubic feet per day (Bcf/d) by 2025 and will shrink to a "negligible volume" by 2040, meaning LNG exports will be needed as an outlet for a huge and expensive surplus.

Net pipeline exports to the US have already decreased from a high of 10.6 Bcf/d in 2007 to 7.4 Bcf/d at the end of last year.

With the continued development of US shale-gas resources, such as the Marcellus, the US now relies less on Canadian imports to meet demand.

US cut-off

By 2040, the Canadian report projects that US natural gas exports to eastern Canada will largely offset Canadian natural gas exports into the US.

With the decline of natural gas exports to the US, the Canadian report says LNG exports are expected to be the primary driver of Canadian natural gas production growth, with output increasing from 15 Bcf/d in 2015 to nearly 18 Bcf/d in 2025.

The NEB analyses two additional cases to explore the impact of LNG exports on natural gas production.

In a low-LNG case, where no liquefaction facilities are constructed, production remains at the 2015 level of 15 Bcf/d through 2040.

In a high-LNG case, where LNG exports reach 4.0 Bcf/d by 2023 and 6.0 Bcf/d by 2030, production increases to 22 Bcf/d by 2040.

Urgency

Based on these results, the report anticipates that future Canadian natural gas production growth will rely on the construction of LNG export capacity.

The LNG option is more urgent, given the high investments already made in the increased development of tight-gas and shale-gas resources in the Western Canadian Sedimentary Basin.

A tight-gas field is one that can be made economic with a combination of horizontal wells and fracture stimulation.

The report expects shale-gas and tight-gas development to continue as Canada's domestic production grows to nearly 18 Bcf/d by 2025.

Tight-gas accounts for 70 percent of projected production in 2025, and most of this natural gas is from the Montney formation in British Columbia and Alberta, where production is projected to triple from 3.0 Bcf/d to 9.6 Bcf/d between 2014 and 2040.

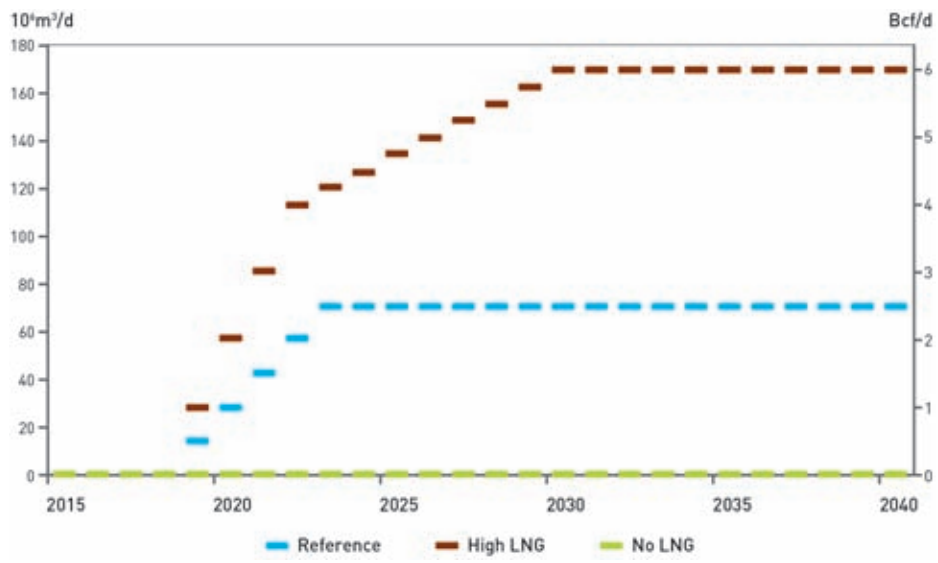
Estimates

Production growth also occurs in the Alberta Deep Basin (tight) and the Horn River Basin (shale). The report said these increases offset the decline in production from other resources.

The Board said marketable Canadian natural gas resources were estimated at 1,087 trillion cubic feet (Tcf).

Marketable tight-gas resources in Canada are estimated to be 528 Tcf. This includes 447 Tcf in the Montney play, located in northeast BC and northwest Alberta.

The total of Canadian shale-gas resource is estimated at 222 Tcf. The Horn River Basin, a shale play in northeast BC, is estimated to contain 78 Tcf.



Canadian LNG export volumes in high, low and none cases

Shale-gas resources outside western Canada, such as the Utica Shale in Quebec and the Horton Bluff Shale in the Maritimes, were not included in the Board's estimate as they are in the early stages of assessment

The Board said that to date there are 30 LNG export project applications that have reached its desk.

"There is also considerable interest in exporting LNG from Canada and several export facilities have been proposed," the report said, noting that at the end of 2015, the NEB had approved 23 applications for long-term LNG export licences, and another seven applications were before the Board.

"The cumulative total volume of the granted licences is 358.4 million tonnes per annum, a gaseous equivalent of 1,277,106 cubic metres per day (45 Bcf/d). This volume is more the total amount of LNG currently traded globally," it said.

"As noted in a recent decision issued by the NEB on an export application, it is unlikely that all LNG export licences issued by the Board will be used or used to their full allowance," it said.

"The majority of the proposed Canadian projects plan to export LNG from the BC Coast. The source of natural gas feedstock for these projects would be western Canadian natural gas supplies.

"There are also current proposals to export LNG from Nova Scotia, New Brunswick, and Quebec. Natural gas for these projects could be sourced from western Canada, the US Northeast and possibly from East Coast offshore production," it explained.

While several projects are actively working towards exporting LNG from Canada, no proponents have proceeded beyond the approval stage and begun construction.

"There is considerable uncertainty regarding how much LNG will be exported from Canada," the report said.

Global needs

"The numerous projects currently under construction around the world could provide sufficient capacity to meet global LNG demand for many years to come, leaving limited room for Canada in the market.

"However, Canada's advantageous location relative to the Asian market, and its abundant natural gas supplies could make it a competitive player in the global LNG market," it added.

"Other uncertainties that could impact Canada's future LNG export volumes include North American and global natural gas prices, crude oil prices, the pace of global LNG demand growth, and the ability of LNG proponents to address environmental and social concerns," it said.

The Board said the volumes of LNG exports are assumptions and do not represent its own firm view on future LNG exports.

It also added that none of the LNG volumes assumed in the reference and high LNG cases include LNG exports from the Maritimes or Quebec.

several smaller LNG export facilities have been proposed that ... plan to purchase their natural gas feedstock directly from domestic markets

Feedstock

"The LNG export volumes in the Reference and High LNG cases are not associated with any specific proposed LNG project. Instead, generic LNG facilities were developed for use in this analysis with common characteristics of existing well-defined projects," it said.

"Several proponents of well-defined LNG export proposals on the BC Coast own significant natural gas assets in western Canada. Most of the well-advanced projects plan to source a majority of their natural gas feedstock from their own natural gas reserves, or corporate reserves. These project proponents will directly increase or decrease drilling activity and production in response to higher or lower LNG export volumes.

"While the majority of natural gas feedstock would be sourced from proponents' upstream assets, some feedstock would be purchased from the domestic natural gas market. Most proposed LNG projects are structured to allow access to major natural gas pipeline networks in western Canada.

"This access enables LNG proponents to buy natural gas when needed," it said.

"In addition, several smaller LNG export facilities have been proposed that do not intend to produce their own natural gas. These facilities plan to purchase their natural gas feedstock directly from domestic markets.

"The generic LNG facilities assumed in the reference and high LNG cases are supplied by roughly 85 per cent natural gas produced from corporate reserves. The remaining natural gas is sourced from domestic market purchases," it said.

The Board also examined the fact that the liquefaction plants themselves will by consumers of energy.

"LNG export facilities require considerable amounts of energy, especially for cooling natural gas.

Infrastructure

"In addition, increases in production resulting from LNG exports affects the amount of energy used for natural gas drilling, processing, and transporta-tion by pipeline. Also, the pace of development of LNG affects the broader economy, which in turn affects energy use, especially in BC.

"The liquefaction process is largely powered by a portion of the facilities' natural gas supply. Auxiliary power requirements, such as for lighting and non-cooling equipment, are met by grid-purchased electricity.

"Energy consumption by LNG facilities in the reference case in 2040 is 53 petajoules of natural gas and six PJ of electricity, or about 3 percent of BC's total end-use demand.

"In the high LNG case, LNG facilities use 130 PJ of natural gas and 15 PJ of electricity by 2040. There is no liquefaction demand in the No LNG Case.

"To help meet the additional electricity requirements for LNG facilities, two 100 megawatts natural gas-fired combined cycle units come online in 2019 and 2021 in the reference case.

"In the high LNG case, two 200MW natural gas-fired combined cycle units come online in 2019 and 2021," it said.

It goes on to note that the total volume of LNG exports in the high LNG case could be higher than its analysis assumes because future global demand for LNG is uncertain. "Higher LNG export demand would further increase Canadian natural gas production," it said. ■

Future of LNG as a ship fuel develops in line with new regulations and bunkering use

Gerd-Michael Wuersig, Business Director, DNV GL Hamburg, Germany

Natural gas prices have followed the price reduction of crude oil, but not to the same extend. The spot market price for gas in Europe is still below the price of marine gas oil (MGO) and at the same level as heavy fuel oil (HFO).

It should be noted that the availability of LNG is increasing as the global prices decline.

Until the end of 2018, the new liquefiers in Australia and US alone will add 116 million tonnes per annum to the LNG market.

CMA Ships and DNV GL studied feasibility of vessel with LNG fuel

Output

This is an increase in production of 38 percent compared to 2014. Even if the major part of the LNG is used in industry and households, shipping remains a possibility to open additional markets which may be needed to match the balance between production and consumption of LNG for the years to come.

Independent from the current price situation the years to come will see a change in shipping towards more environmentally-friendly fuels and LNG has the potential to be the most relevant of these fuels.

The main arguments for choosing LNG as ship fuel are:

- LNG is available worldwide in sufficient quantities to meet the requirements of shipping
- It has the potential to be price competitive with oil-based fuels
- CO2, NOx emissions can be reduced significantly without additional technical measures
- Particle emissions and SOx emissions are eliminated completely

The expectations towards the introduction of LNG as ship fuel were high at the beginning of the decade.

Emissions

This was based on the expectation that emissions requirements would become even stricter and the fuel oil price would remain high.

However, even when you factor out the current oil price, it must be noted that the uptake of LNG in shipping has taken longer than expected for the following reasons:

- Technology and rule development needed longer than expected in 2000, when the first non-gas carrier with LNG as fuel came into service.
  - E.g. the workhorse of shipping is the 2-stroke engine. The 2-stroke for LNG as fuel has been available since late 2012 (MAN), and since the middle of 2014 (WinGD; former Wärtsilä)
  - E.g. the international rules from IMO (IGF-Code) was adopted at IMO MSC-95, 12 of June 2015 and will come into force in 2017
- The development of infrastructure requires a proportional increase in demand, which is slowly developing. The first bunker ships will be available in late 2016 / beginning 2017.

Nevertheless, LNG as a fuel is being taken up more. This becomes obvious when there are currently 75 vessels running on LNG and 84 on order (January 2016) compared to the LNG-fuelled fleet consisting in October, 2012, of 31 ships and 32 orders.

Among the ships on order today are four large cruise ships, 14 container ships, 11 oil/chemical tankers and seven ROPax/RO-RO ships.

In addition, the orders for LNG-fuelled ships are coming from outside the traditional Norwegian niche market.

Between 2000 and 2013 all vessel fuelled with LNG were operating in Norwegian waters. This picture has changed. Still around 70 percent of the existing fleet is from Norwegian waters but only 14 percent of the orders are for this operational area.

About 55 percent of the orders come from the rest of Europe and 27 percent from America.

The main infrastructure for the supply of LNG to ships are the import terminals. The terminals can provide fuel to bunker ships, which supply the LNG.

Bunkering

Currently around seven dedicated LNG bunker ships are under construction and will come into service from 2017 onwards. Most of these ships have an LNG capacity between 5,000 and 7,000 cubic metres.

A full utilization of a bunker ship should enable the vessel to deliver the LNG taken from a terminal within one week.

The radius of operation of such a vessel will be around 200 to 250 nautical miles around an LNG terminal.

In this case it should be possible to deliver the LNG for a competitive price. With such a distribution model nearly all major shipping areas can be covered.

Amounts

The amount of LNG, which will be bunkered by LNG-fuelled ships, can be categorized into the following groups:

- Between 30 and 100 cubic metres of LNG is typical for ferries running on dedicated routes with the possibility for frequent refuelling. Fuelling can be done by road truck or a small bunker ship.
- Between 200 and 1,000 cubic metres for commercial ships operating in coastal waters with a refuelling approximately every 10 days. These ships will typically be refuelled by bunker ships.
- Above 1,000 cubic metres and up to 10,000 cubic metres for commercial ships in international trade. For these ships the only possibility is to refuel them by bunker ships.

It can be assumed that tank sizes above 10,000 cubic metres will not been used very often.

The main reasons are that the negative effect for the transport capacity becomes too big and the high CAPEX of the tanks is difficult to justify by a longer range of the ship alone.

Even ultra large container ships are able to run more than half a round voyage between Asia and Europe with an LNG tank capacity of 10,000 cubic metres.

If it is assumed that a typical bunker ship may supply LNG to 10 to 15 ships within one week and that an LNG-fuelled ship will bunker every 10 days, a bunker ship may serve 14 to 24 mid-sized ships.

Sources

Methanol can be regarded as another alternative fuel for shipping if it is produced from biomass. It definitely has advantages with regard to handling and Capex for the system on board.

The current methanol production is by far too low to meet shipping requirements.

In fact there are no relevant methanol resources which may be used for ships. This is different for LNG.

Natural gas production represents approximately 10 times the needed energy for shipping and the LNG production today is much higher than the complete need for shipping and increasing rapidly. Even if the complete shipping fleet turns to LNG today there will still be a lot available for other purposes.

If methanol shall become an alternative ship fuel a massive increase in methanol production is needed.

The most likely financially and

technically practical way would be the production of Methanol from natural gas.

Process

This is also today the way how most methanol is produced. The energy efficiency of such a process is approximately 60 to 70 percent. The energy efficiency of LNG production is about 91 to 94 percent of all energy consumption if the liquefaction is considered

In other words in LNG at least 91 to 94 percent of the energy which is needed to produce it is available in the LNG. With methanol only 60 to 70 percent of the energy supplied to the production process is available in the resulting Methanol.

If the difference in gas feed is considered it is difficult for methanol produced by natural gas to compete with LNG.

It should be noted that most of the losses in methanol production are related to the chemical reaction and therefore directly related to the natural gas feed. With LNG the energy for liquefaction may come from external sources and not necessarily mean losses related to the natural gas feed.

For these fundamental physical reasons it is difficult for methanol to become an option for ship fuel on a large scale.

Costs

Experience shows that the operating expenses for LNG-fuelled ships remains approximately at the level of a conventional ship, even if the additional components are considered. This is a direct result of the cleaner burning of the fuel.

The additional capital cost of an LNG fuel system compared to a conventional system with HFO as fuel is approximately twice the additional costs which have to be considered if a scrubber system is installed.

This picture changes somewhat if the TIER III requirements must be considered for a conventional system.

Nevertheless, the additional costs for scrubbers, SCR, EGR, etc. which may be needed in a conventional system will still not reach the level of the additional Capex involved in the construction of an LNG-fuelled ship.

The potential CO2 emission reduction of LNG is over 25 percent compared to conventional fuels (tank to propeller). This potential can be fully realized if there is no methane slip, or only a very small release of unburned methane, as is the case in gas turbines for example.

Manufacturers of 4-stroke engines indicate that they are able to reach values of approximately 10 to 20 percent CO2 reduction if "methane slip" is considered. In any case, the change from oil-based fuel to LNG results in an IMO EEDI (Energy Efficiency Design Index) score which is approximately 30 percent below that of an oil-fuelled ship.

Today in shipping, there are no direct costs incurred for CO2 emissions, but this may change in the future.

The cost difference between LNG and oil-based ship fuels can be compensated either directly by the price difference between the oil fuel and the LNG, and/or indirectly by monetization of the environmental benefits of LNG as a ship fuel. In the current oil price situation compensation by price difference alone, is difficult.

Perfect ship

LNG is a very clean burning fuel, enabling the use of new concepts for the propulsion and auxiliary systems. One illustration of the new horizons in shipping technology enabled by use of LNG as a ship fuel is the "Ship Project".

Last year GTT, CMA CGM subsidiary CMA Ships and DNV GL studied the technical design and economic feasibility for an electric-driven 20,000 TEU ULCV vessel with an LNG-fuelled combined-cycle gas and steam turbine (COGAS) electric power plant.

The ship, equipped with LNG membrane tanks for one full Asia-Europe return voyage, was benchmarked against a conventional HFO-fuelled vessel featuring the same hull shape and operating in the same trade. The high-level study addresses the technical feasibility and overall fuel efficiency, and includes a preliminary economic assessment.

The study shows considerable benefits due to capacity gains at the same efficiency level. It demonstrates that the use of the clean LNG fuel has significant efficiency benefits which cannot be achieved by a conventional-fuelled COGAS system.

The potential for an optimized LNG-fuelled COGAS system together with an optimized ship design for this system is expected to go even beyond the efficiency of the oil-fuelled engine systems used today.

At the same time, cargo capacity is increased by the use of LNG and not decreased as is the case for LNG-fuelled piston engine systems. In fact, the cargo capacity is higher than the capacity of a conventional oil-fuelled ship of the same size.

This is the result of placing the COGAS system at deck level within the area of the deck house and the LNG tanks. Therefore, nearly the complete space normally occupied by the engine room and the funnel structure can be used for cargo.

The electric power generation allows the power plant to be split from the propulsion motors. For this reason, a conventional engine room is not needed any more.

In addition, the three electric main motors, which are arranged on one common shaft, can run fully independently from each other, providing increased redundancy and reliability.

With gas-turbine-driven power production, utilizing a very clean fuel and with electric propulsion, the ship's machinery systems are simplified and made much more robust.

It is expected that this approach can lead to new maintenance strategies as found in the airline industry, which may make it possible to reduce the ship's engine crew, leading to further cost savings.

Optimizing the power plant by minimizing the steam turbine size, reducing power capacities, condenser cooling, using a two-stage pressure steam turbine and steam generator will increase the system's efficiency further. The net efficiency is expected to be well above conventional-fuelled piston engine ships.

Conclusion

Shipping is currently in a period of change in terms of the fuel mix. Environmental challenges, the need to reduce CO2 emissions and also the change in fuel availability caused by technical upgrading in the refinery industry are leading to a diversification in the ship fuel used.

Natural gas as a ship fuel has the biggest potential to become a widely used fuel compared with any of the alternatives to oil-based fuels currently available.

Experience shows that the operating expenses for LNG-fuelled ships remains approximately at the level of a conventional ship

The technology and legislation to enable this is already available and there are no technical obstacles to the use of natural gas as a fuel in shipping.

In practice, natural gas has to be stored on board of ships as LNG to enable a reasonable operation range for most applications. The increase in LNG production supports the development of new markets for LNG and shipping can be a relevant new market for this expected additional supply.

LNG as a fuel solution meets the current needs of a world which has to be more sustainable.

But it may not be the last solution. In the long term the world may need a carbon-free energy and fuel supply.

But even in this case the shipping and aviation industries will continue to require high energy density fuels to operate.

Using CO2 and Hydrogen as base molecules open the possibility of producing a vast range of fuels - from methane to "diesel like" fuels. Considering the advantages of diesel fuel in terms of handling and energy density, it may once again return to use in shipping at that time. ■

This article is based on extracts from a presentation made at the LNG 18 conference in Perth, Western Australia, on April 14, 2016.

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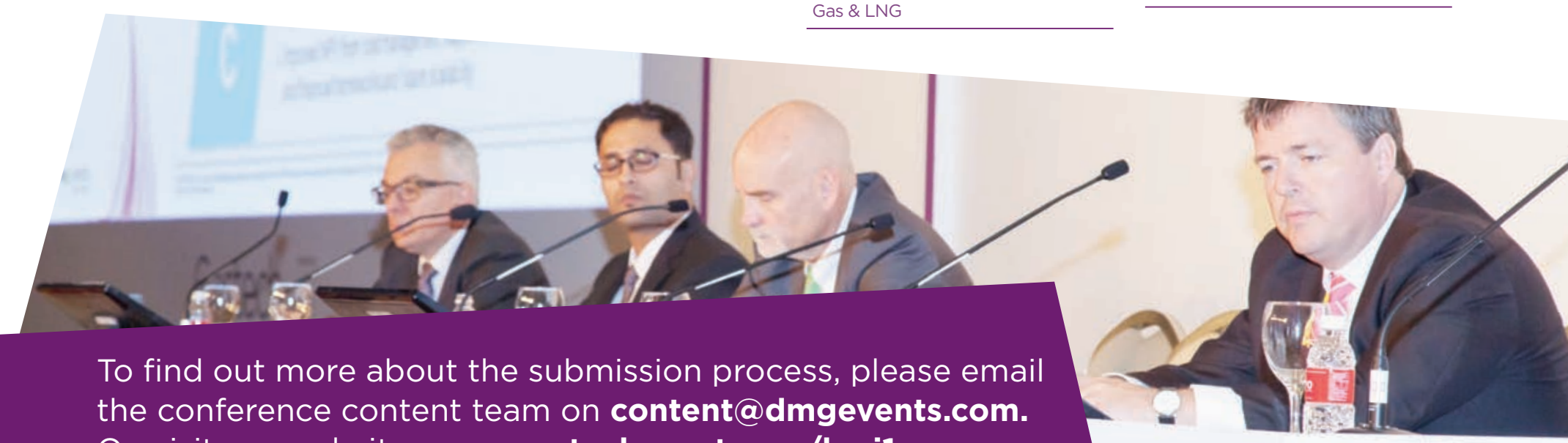

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World LNG Carrier Fleet

LNG carrier	Capacity m^3	Owned or Ordered by	Builder	Delivery Date	Flag	Power Plant	Cargo System	No. of tanks	Ship built for Export plant
Aamira	266,000	QGTC	Samsung	Dec-10	Liberia	DRL	TZ Mk. III	5	Qatargas IV
Abadi	135,000	Brunei Gas Carriers	Mitsubishi Nagasaki	Jun-02	Brunei	S	Moss	5	Brunei LNG
Abdelkader	177,000	MOL-Itochu	Hyundai	Feb-09	Panama	DFDE	TZ Mk. III	4	Various
Adam LNG	162,000	Oman LNG	Hyundai	Dec-14	Marshall Is.	DFDE	TZ Mk. III	4	Oman LNG
Al Aamriya	210,100	J5 Consortium	Daewoo	Feb-08	Marshall Is.	DRL	GT NO 96	4	Qatargas
Al Areesh	151,700	Teekay LNG	Daewoo	Jan-07	Qatar	S	GT NO 96	4	Ras Gas II
Al Bahiya	266,000	QGTC	Samsung	Oct-09	Liberia	DRL	TZ Mk. III	5	Qatar-Atlantic
Al Biddah	135,275	J4 Consortium	Kawasaki Sakaide	Nov-99	Japan	S	Moss	5	Qatargas
Al Daayen	151,700	Teekay LNG	Daewoo	Apr-07	Qatar	S	GT NO 96	4	RasGas II
Al Dafna	266,000	QGTC	Samsung	Oct-09	Marshall Is.	LR DRL	GT NO 96	4	Qatar-Atlantic
Al Deebel	145,000	Peninsular LNG	Samsung	Dec-05	Bahamas	S	TZ Mk. III	4	Qatargas
Al Gattara	216,200	OSG/Nakilat	Hyundai	Oct-07	Marshall Is.	DRL	TZ Mk. III	4	Qatargas II
Al Ghariya	210,100	ProNav	Daewoo	Feb-08	Bahamas	DRL	GT No. 96	4	Qatargas
Al Gharaffa	216,200	OSG/Nakilat	Hyundai	Jan-08	Marshall Is.	DRL	TZ Mk. III	4	Various
Al Ghashamiya	216,000	QGTC	Samsung	Mar-09	Liberia	DRL	TZ Mk. III	4	Qatar-Atlantic Basin
Al Ghuwairiya	261,700	QGTC	Daewoo	Aug-08	Marshall Is.	DRL	GT NO. 96	5	Qatar-Atl'c Basin
Al Hamla	216,000	OSG	Samsung	Feb-08	Marshall Is.	DRL	TZ Mk. III	4	QatarGas
Al Hamra	137,000	National Gas Shipping	Kvaerner-Masa	Jan-97	Liberia	S	Moss	4	ADGAS
Al Huwaila	217,000	Teekay	Samsung	May-08	Bahamas	DRL	TZ Mk. III	4	RasGas III
Al Jasra	137,100	J4 Consortium	Mitsubishi Nagasaki	Jul-00	Japan	S	Moss	5	Qatargas
Al Jassasiya	145,700	Maran-Nakilat	Daewoo	May-07	Greece	S	GT No 96	4	RasGas
Al Kharaitiyat	216,200	QGTC	Hyundai	May-09	Liberia	DRL	TZ Mk. III	4	Qatargas III
Al Kharaana	210,000	QGTC	Daewoo	Oct-09	Marshall Is.	DRL	GT NO 96	4	Qatargas IV
Al Kharsaah	217,000	Teekay	Samsung	May-08	Bahamas	DRL	TZ Mk. III	4	RasGas III
Al Khattiya	210,000	QGTC	DSME	Oct-09	Marshall Is.	DRL	GT No. 96	4	Qatargas IV
Al Khaznah	135,500	National Gas Shipping	Mitsui Chiba	Jun-94	Liberia	S	Moss	5	ADGAS
Al Khor	137,350	J4 Consortium	Mitsubishi Nagasaki	Dec-96	Japan	S	Moss	5	Qatargas
Al Khuwair	217,000	Teekay LNG	Samsung	Jul-08	Korea	DRL	TZ Mk. III	4	RasGas
Al Mafyar	266,000	OSG/Nakilat	Hyundai	Oct-07	Marshall Is.	DRL	TZ Mk. III	4	Qatargas II
Al Marrouna	151,700	Teekay	Daewoo	Nov-07	Bahamas	S	GT NO 96		Ras Gas I
Al Mayeda	266,000	QGTC	Samsung	Jan-09	Liberia	DRL	TZ Mk. III	5	Qatar-US/Var.
Al Nuaman	210,000	QGTC	DSME	Dec-09	Marshall Is.	DRL	GT No. 96	4	Qatargas IV
Al Oraiq	210,000	J5 Consortium	Daewoo	Apr-08	Marshall Is.	DRL	GT No. 96	4	Various
Al Rayyan	135,360	J4 Consortium	Kawasaki Sakaide	Mar-97	Japan	S	Moss	5	Qatargas
Al Rekayyat	216,200	QGTC	Hyundai	Jun-09	Bahamas	DRL	TZ Mk.III	4	Qatar-Atlantic
Al Ruwais	210,100	ProNav	Daewoo	Nov-07	Germany	DRL	GT NO 96	4	Qatargas II
Al Sadd	210,100	QGTC	Daewoo	Mar-09	Liberia	DRL	GT NO 96	4	Qatar-Atlantic Basin
Al Safliya	210,100	ProNav	Daewoo	Dec-07	Bahamas	DRL	GT NO 96	4	Qatargas II
Al Sahla	216,200	J5	Hyundai	Jun-08	Japan	DRL	TZ Mk. III	4	Ras Gas III
Al Samriya	261,700	QGTC	Daewoo	Sep-08	Marshall Is.	DRL	GT NO. 96	5	Qatargas II
Al Sheehaniya	210,100	QGTC	Daewoo	Feb-09	Liberia	DRL	GT NO 96	4	Qatar-Atlantic Basin
Al Shamal	217,000	Teekay LNG	Samsung	Jun-08	Qatar	DRL	TZ Mk. III	4	RasGas
Al Thakhira	145,000	Peninsular LNG	Samsung	Sep-05	Bahamas	S	TZ Mk. III	4	Qatargas
Al Thumama	216,000	J5 Consortium	Hyundai	Apr-08	Japan	DRL	TZ Mk. III	4	Rasgas
Al Utouriya	215,000	J5	Hyundai	Sep-08	Panama	DRL	TZ Mk. III	4	RasGas
Al Utourma	215,000	J5	Hyundai	Sep-08	Panama	DRL	TZ Mk. III	4	Ras Gas III
Al Wajbah	137,350	J4 Consortium	Mitsubishi Nagasaki	Jun-97	Japan	S	Moss	5	Qatargas
Al Wakrah	135,360	J4 Consortium	Kawasaki Sakaide	Dec-98	Japan	S	Moss	5	Qatargas
Al Zhubarah	137,570	J4 Consortium	Mitsui Chiba	Dec-96	Japan	S	Moss	5	Qatargas
Alto Acrux	147,000	LNG Marine Transport	Mitsubishi	Mar-08	Bahamas	S	Moss	4	Various
Amali	148,000	Brunei-Shell	DSME	Jul-11	Brunei	DFDE	GT No. 96	4	Brunei LNG
Amanl	154,800	Brunei-Shell	Hyundai	Nov-14	Brunei	DFDE	TZ Mk. III	4	Brunei LNG
Aman Bintulu	18,928	Perbadanan / NYK Line	NKK Tsu	Oct-93	Malaysia	S	TZ Mk. III	3	Petronas
Aman Hakata	18,800	Perbadanan / NYK Line	NKK Tsu	Nov-98	Malaysia	S	TZ Mk. III	3	Petronas
Aman Sendai	18,928	Perbadanan / NYK Line	NKK Tsu	May-97	Malaysia	S	TZ Mk. III	3	Petronas
Arctic Aurora	160,000	Dynagas	Hyundai	Jul-13	Marshall Is.	DFDE	TZ Mk. III	4	Various
Arctic Discoverer	140,000	K Line	Mitsui Chiba	Jan-06	Bahamas	S	Moss	4	Various
Arctic Lady	147,200	MOL/Hoegh LNG	Mitsubishi Nagasaki	Apr-86	Norway	S	Moss	4	Various
Arctic Princess	147,200	MOL/Hoegh LNG	Mitsubishi Nagasaki	Jan-06	Norway	S	Moss	4	Various
Arctic Sun	89,880	Arctic LNG Shipping	IHI Chita	Dec-93	Liberia	S	IHI SPB	4	ConocoPhillips/Marathon
Arctic Voyager	140,000	K Line	Kawasaki	Jul-06	Bahamas	S	Moss	4	Statoil
Arkat	148,000	Brunei-Shell	DSME	Feb-11	Brunei	DFDE	GT. No. 96	4	Brunei LNG
Arwa Spirit	165,000	Teekay LNG	Samsung	Sep-08	Marshall Is.	DFDE	TZ Mk. III	4	Various
Asia Endeavour	160,000	Chevron	Samsung	Dec-14	Bahamas	DFDE	TZ Mk. III	4	Various
Asia Energy	160,000	Chevron	Samsung	Sept-14	Bahamas	DFDE	TZ Mk. III	4	Various
Asia Excellence	160,000	Chevron	Samsung	Sept-13	Bahamas	DFDE	TZ Mk. III	4	Various
Asia Vision	160,000	Chevron	Samsung	June-14	Bahamas	DFDE	TZ Mk. III	4	Various
Barcelona Knutsen	173,400	Knutsen	Daewoo	May-10	N.I.S.	DFDE	GT NO 96	4	Various
Bebatic	75,060	Brunei Shell Tankers	Atlantique	Oct-72	Brunei	S	TZ Mk. I	6	Brunei LNG
Beidou Star	172,000	MOL	Hudong	Oct-15	Hong Kong	DRL	GT NO. 96	4	Various
Berge Arzew	138,088	BW Gas	Daewoo	Jul-04	Norway	S	GT NO 96	4	Sonatrach
BW GDF-Suez Boston	138,059	BW Gas	Daewoo	Jan-03	Norway	S	GT NO 96	4	Suez LN
BW GDF Suez Everett	138,028	BW Gas	Daewoo	Jun-03	Norway	S	GT NO 96	4	Suez LNG
Bilbao Knutsen	138,000	Knutsen / Marpetrol	IZAR Sestao	Jan-04	Spain	S	GT NO 96	4	Atlantic LNG
Bilis	77,730	Brunei Shell Tankers	La Seyne	Mar-75	Brunei	S	GT NO 82	5	Brunei LNG
Bishu Maru	162,000	K Line-Transpacific	Kawasaki Sakaide	Dec-15	Panama	S	Moss	4	Australia-Japan
British Diamond	155,000	BP Shipping	Hyundai	Sep-08	IOM	DFDE	TZ Mk. II	4	Indonesia-Various
British Emerald	155,000	BP Shipping	Hyundai	Jun-07	UK	DFDE	TZ Mk. III	4	Tangguh LNG
British Innovator	138,200	BP Shipping	Samsung	Jul-03	Isle of Man	S	TZ Mk. III	4	Various

British Merchant	138,000	BP Shipping	Samsung	Apr-03	Isle of Man	S	TZ Mk. III	4	Various
British Ruby	155,000	BP Shipping	Hyundai	Jan-08	U.K.	DFDE	TZ Mk. III	4	Various
British Sapphire	155,000	BP Shipping	Hyundai	Sep-08	IOM	DFDE	TZ Mk. III	4	Tangguh
British Trader	138,000	BP Shipping	Samsung	Dec-02	Isle of Man	S	TZ Mk. III	4	Engas
Broog	135,466	J4 Consortium	Mitsui Chiba	May-98	Japan	S	Moss	5	Qatargas
Bu Samara	266,000	QGTC	Samsung	Dec-08	Qatar	DRL	TZ Mk. III	5	Qatargas
BW Suez Paris	162,400	BW Gas	Daewoo	May-09	N.I.S.	DFDE	GT NO 96	4	Yemen-Atlantic
BW Suez Brussels	162,400	BW Gas	Daewoo	May-09	N.I.S.	DFDE	GT NO 96	4	Yemen-Atlantic
Cadiz Knutsen	138,826	Knutsen / Marpetrol	IZAR Puerto Real	Jun-04	Spain	S	GT NO 96	4	Engas
Castillo de Santisteban	173,600	Elcano	STX	Aug-10	Malta	S	GT NO. 96		Various
Castillo de Villalba	138,000	Elcano	IZAR	Nov-03	Spain	S	GT NO 96	4	Sonatrach
Catalunya Spirit	138,000	Teekay LNG Partners	IZAR Sestao	Mar-03	Liberia	S	GT NO 96	4	Atlantic LNG
Celestine River	145,000	KLNG	Kawasaki	Dec-07	Bahamas	S	Moss		Various
Cheikh Bouamama	75,500	Skikda LNG Transport	USC	Jul-08	Bahamas	S	TZ Mk. III	4	Sonatrach
Cheikh El Mokrani	75,500	Med LNG Corp	USC	Jun-07	Bahamas	S	TZ Mk. III	4	Sonatrach
Clean Energy	150,000	Pegasus Shiph'd	Hyundai	Mar-07	Marshall Is.	S	TZ Mk. III	4	Various
Clean Force	150,000	Seacrown Mariti	Hyundai	Jan-08	Marshall Is.	S	TZ Mk. III	4	Various
Clean Ocean	155,900	Dynagas	Hyundai	Mar-14	Marshall Is.	DFDE	TZ Mk. III	4	Various
Clean Planet	155,900	Dynagas	Hyundai	Mar-14	Marshall Is.	DFDE	TZ Mk. III	4	Various
Clean Vision	160,000	Dynagas	Hyundai	Jun-15	Marshall Is.	DFDE	TZ Mk. III	4	Various
Cool Explorer	160,000	Thenamaris	Samsung	Oct-13	Bermuda	DFDE	TZ Mk. III	4	Various
Cool Runner	160,000	Thenamaris	Samsung	May-14	Bermuda	DFDE	TZ Mk. III	4	Various
Cool Voyager	160,000	Thenamaris	Samsung	Oct-13	Bermuda	DFDE	TZ Mk. III	4	Various
Corcovado LNG	160,106	TMSC Gas	Daewoo	Jun-14	Malta	TFDE	GT No 96	4	Various
Creole Spirit	174,000	Teekay	Daewoo	Jan-16	Bahamas	MEGI-DF	NO. 96 GW	4	Cheniere
Cubal	160,400	Mitsui/NYK/Teekay	Samsung	Jan-12	Bahamas	DFDE	TZ Mk. III	4	Various
Cygnus Passage	145,400	Cygnus LNG	Mitsubishi	Feb-09	Panama	S	Moss	4	Various
Dapeng Moon	147,000	China Ships	Hudong	Jul-09	China	S	GT NO 96	4	Various
Dapeng Star	147,000	China Ships	Hudong	Nov-09	China	S	GT NO 96	4	Various
Dapeng Sun	147,000	China Ships	Hudong	Jul-07	China	S	GT NO 96	4	Woodside Energy
Disha	136,000	Petronet LNG Ltd.	Daewoo	Jan-04	Malta	S	GT NO 96	4	Qatargas
Doha	137,350	J4 Consortium	Mitsubishi Nagasaki	Jun-99	Japan	S	Moss	5	Qatargas
Duhail	210,100	ProNav	Daewoo	Jan-08	Germany	DRL	GT NO 96	4	Various
Dukhan	135,000	J4 Consortium	Mitsui Chiba	Oct-04	Japan	S	Moss	4	Qatargas
Dwiputra	127,385	Humpuss Consortium	Mitsubishi Nagasaki	Mar-94	Bahamas	S	Moss	4	Pertamina
Ebisu	147,547	Golar LNG	Kawasaki	Sep-08	Bahamas	S	Moss	4	Various
Ejnan	145,000	4J	Samsung	Jan-07	Bahamas	S	TZ Mk. III		RasGas
Ekaputra	136,400	Humpuss Consortium	Mitsubishi Nagasaki	Jan-90	Liberia	S	Moss	5	Pertamina
Energy Advance	145,000	Tokyo LNG Tankers	Kawasaki Sakaide	Mar-05	Japan	S	Moss	4	Darwin
Energy Atlantic	159,924	Alpha	STX Jinhae	Sep-15	Malta	DFDE	No. 96	4	Various
Energy Confidence	155,000	Tokyo LNG Tankers	Kawasaki	Apr-09	Panama	S	Moss	4	Various
Energy Frontier	147,600	Tokyo LNG Tankers	Kawasaki Sakaide	Sep-03	Japan	S	Moss	4	Darwin
Energy Horizon	177,000	Tokyo LNG Tankers	Kawasaki	Jul-11	Japan	S	Moss	4	Pluto LNG
Energy Navigator	147,000	Tokyo LNG Tankers	Kawasaki Sakaide	May-08	Japan	S	Moss	4	Various
Energy Progress	145,000	MOL	Kawasaki	Nov-06	Japan	S	Moss	4	Bayu Undan LNG
Esshu Maru	162,000	K Line-Transpacific	Kawasaki Sakaide	Dec-14	Panama	S	Moss	4	Australia-Japan
Excalibur	138,200	Exmar/ Excelerate	Daewoo	Oct-02	Belgium	S	GT NO 96	4	Various
Excel	138,106	Exmar/ MOL	Daewoo	Sep-03	Belgium	S	GT NO 96	4	Various
Excelerate	138,000	Exmar/Excelerate	Daewoo	Oct-06	Belgium	S	GT NO 96	4	Various
Excellence	138,000	GKFF Ltd.	Daewoo	May-05	Belgium	S	GT NO 96	4	Excelerate Energy
Excelsior	138,000	Exmar	Daewoo	Jan-05	Belgium	S	GT NO 96	4	Various
Exemplar	150,900	Excelerate	Daewoo	Jun-10	Belgium	S	GT NO 96	4	Various
Expedient	151,000	Excelerate	Daewoo	Nov-09	Belgium	S	GT NO 96	4	Various
Experience RV	174,000	Exmar/Excelerate	Daewoo	Jul-14	Marshall Is.	DFDE	GT NO 96		Various
Explorer	150,900	Exmar/Excelerate	Daewoo	Mar-08	Belgium	S	GT NO 96	4	Excelerate
Express	151,000	Exmar/Excelerate	Daewoo	May-09	Belgium	S	GT NO 96	4	Various
Exquisite	150,900	Excelerate	Daewoo	Sep-09	Belgium	S	GT NO. 96	4	Various
Fraiha	210,100	J5 Consortium	Daewoo	Sep-08	Marshall Is.	DRL	GT NO 96	4	Qatargas
FSRU Independence	170,000	Hoegh	Hyundai	Feb-14	NIS	DFDE	TZ Mk. III	4	Various
FSRU Lampung	170,000	Hoegh	Hyundai	May-14	Indonesia	DFDE	TZ Mk. III	4	Various
Fuji LNG	147,895	TMSC Gas	Kawasaki	Jun-04	Malta	S	Moss	4	Various
Fuwairit	138,000	Peninsular LNG	Samsung	Jan-04	Bahamas	S	TZ Mk. III	4	RasGas II
Galea	134,425	Shell Shipping	Mitsubishi Nagasaki	Oct-02	Singapore	S	Moss	5	Shell
Galicia Spirit	140,620	Teekay LNG Partners	Daewoo	Jul-04	Liberia	S	GT NO 96	4	Engas
Gaselys	153,500	GdF/NYK	Atlantique	Mar-07	France	DFDE	CS 1	4	Engas
Gallina	134,425	Shell Shipping	Mitsubishi Nagasaki	Oct-02	Singapore	S	Moss	5	Shell
GasLog Chelsea	153,000	GasLog	Hanjin Korea	Dec-09	Panama	TFDE	TZ Mk. III	4	Various
GasLog Salem	165,000	GasLog	Samsung	Apr-15	Liberia	TFDE	TZ Mk. III	4	various
GasLog Santiago	155,000	GasLog	Samsung	Mar-13	Liberia	TFDE	TZ Mk. III	4	Various
GasLog Saratoga	155,000	GasLog	Samsung	Dec-14	Bermuda	TFDE	TZ Mk. III	4	Various
Gaslog Savannah	155,000	GasLog	Samsung	May-10	Bermuda	DFDE	TZ Mk. III	4	Various
GasLog Seattle	155,000	GasLog	Samsung	Oct-13	Bermuda	TFDE	TZ Mk. III	4	Various
GasLog Shanghai	155,000	GasLog	Samsung	Jan-13	Liberia	TFDE	TZ Mk. III	4	Various
Gaslog Singapore	155,000	GasLog	Samsung	Jul-10	Bermuda	DFDE	TZ Mk. III	4	Various
Gaslog Skagen	155,000	GasLog	Samsung	Oct-13	Bermuda	DFDE	TZ Mk. III	4	Various
Gaslog Sydney	155,000	GasLog	Samsung	May-13	Bermuda	DFDE	TZ Mk. III	4	Various
GDF-Suez Global Energy	74,000	Gaz de France	Chantiers	Dec-06	France	DFDE	CS1	4	Sonatrach
GDF-Suez Cape Ann	145,000	Hoegh LNG/MOL	Samsung	May-10	Liberia	DFDE	TZ Mk. III	4	Various
GDF-Suez Neptune	145,000	Hoegh LNG/MOL	Samsung	Dec-09	Liberia	DFDE	TZ Mk. III	4	Various
GDF-Suez Point Fortin	154,200	LNG Japan	Imabari/Koyo	Feb-10	Panama	DFDE	TZ Mk. III	4	Various
Gemmata	138,100	Shell Shipping	Mitsubishi Nagasaki	Mar-04	Singapore	S	Moss	5	Shell
Ghasha	137,510	National Gas Shipping	Mitsui	Jun-95	Liberia	S	Moss	5	ADGAS
Golar Arctic	140,645	Golar LNG	Daewoo	Dec-03	Marshall Is.	S	GT NO 96	4	Shell Spot
Golar Bear	160,000	Golar	Samsung	Mar-14	Bermuda	DFDE	TZ Mk. III	4	Various

Golar Celsius	160,000	Golar LNG	Samsung	Sep-13	Bermuda	DFDE	TZ Mk. III	4	Various
Golar Crystal	160,000	Golar LNG	Samsung	Oct-13	Bermuda	DFDE	TZ Mk. III	4	Various
Golar Eskimo (FSRU)	160,000	Golar LNG	Samsung	Jan-15	Bermuda	DFDE	TZ Mk. III	4	Various
Golar Freeze	125,850	Golar LNG	HDW	Feb-77	UK	S	Moss	5	Various
Golar Glacier	162,000	Golar LNG	Hyundai	Sep-14	Marshall Is.	DFDE	TZ Mk. III	4	Various
Golar Grand	145,880	Golar LNG	Daewoo	2006	IoM		GT NO 96	4	Various
Golar Ice	160,000	Golar LNG	Samsung	Feb-15	Bermuda	DFDE	TZ Mk. III	4	Various
Golar Igloo (FSRU)	160,000	Golar LNG	Samsung	Oct-13	Bermuda	DFDE	TZ Mk. III	4	Various
Golar Kelvin	160,000	Golar LNG	Samsung	Jan-15	Bermuda	DFDE	TZ Mk. III	4	Various
Golar Maria	145,950	Golar LNG	Daewoo	2006	Marshall Is.		GT NO 96	4	Various
Golar Mazo	135,225	Golar LNG/CPP	Mitsubishi	Jan-00	Liberia	S	Moss	5	Pertamina
Golar Penguin	160,000	Golar LNG	Samsung	Mar-14	Marshall Is.	DFDE	TZ Mk. III	4	Various
Golar Seal	160,000	Golar LNG	Samsung	Aug-13	Bermuda	DFDE	TZ Mk. III	4	Various
Golar Singapore (FSRU)	160,000	Golar LNG	Samsung	June-15	Bermuda	DFDE	TZ Mk. III	4	Various
Golar Snow	160,000	Golar LNG	Samsung	Jan-15	Bermuda	DFDE	TZ Mk. III	4	various
Golar Tundra (FSRU)	160,000	Golar LNG	Samsung	Dec-15	Bermuda	DFDE	TZ Mk. III	4	Various
Golar Viking	140,000	Golar LNG	Hyundai	Jan-05	Marshall Is.	S	Moss	4	Various
Golar Winter	138,250	Golar LNG	Daewoo	Apr-04	Marshall Is.	S	GT NO 96	4	Petrobras
Grace Acacia	150,000	Algaet Shipping	Hyundai	Jan-07	Japan	S	TK MK III	4	Various
Grace Barleria	150,000	Swallowtail Ship	Hyundai	Oct-07	Japan	S	TZ Mk. III	4	Various
Grace Cosmos	150,000	AGH Shipping	Hyundai	Mar-08	Japan	S	TZ Mk. III	4	Various
Grace Dahlia	177,000	Tokyo Gas	Kawasaki	Oct-13	Japan	S	Moss	4	Various
Gracilis	138,830	Golar LNG	Hyundai	Jan-05	Marshall Is.	S	TZ Mk III	4	Shell BG
Granatina	140,645	Shell Shipping	Daewoo	Dec-03	Singapore	S	GT NO 96	4	Shell
Grand Aniva	147,200	Sovcomflot/NYK	Mitsubishi	Jan-08	Japan	S	Moss	4	Various
Grand Elena	147,200	Sovcomflot/NYK	Mitsubishi	Oct-07	Japan	S	Moss	4	Various
Grand Mereya	147,200	Primorsk/MOL/K Line	Chiba	May-08	Japan	S	Moss	4	Sakhalin II
Hanjin Muscat	138,200	Hanjin Shipping	Hanjin	Jul-99	Panama	S	GT NO 96	4	Oman Gas
Hanjin Pyeong Taek	130,600	Hanjin Shipping	Hanjin	Sep-95	Panama	S	GT NO 96	4	Pertamina
Hanjin Ras Laffan	138,214	Hanjin Shipping	Hanjin	Jul-00	Panama	S	GT NO 96	4	QatarGas
Hanjin Sur	138,333	Hanjin Shipping	Hanjin	Jan-00	Panama	S	GT NO 96	4	Oman Gas
Hispania Spirit	140,500	Teekay LNG Partners	Daewoo	Sep-02	Spain	S	GT NO 96	4	Atlantic LNG
Hoegh Gallant FSRU	170,050	Hoegh LNG	Hoegh Hyundai	May-14	Marshall Is.	DFDE	TZ Mk. III	4	chartered
Hoegh Grace FSRU	170,050	Hoegh LNG	Hoegh LNG Hyundai	May-15	Marshall Is.	DFDE	TZ Mk. III	4	various
Hyundai Aquapia	135,000	Hyundai MM	Hyundai	Mar-00	Panama	S	Moss	4	Oman Gas
Hyundai	135,000	Hyundai MM	Hyundai	Jan-00	Panama	S	Moss	4	RasGas
Hyundai Ecopia	145,000	Hyundai	Hyundai	Nov-08	Panama	S	TZ Mk. III	4	Various
Hyundai Greenpia	125,000	Hyundai MM	Hyundai	Nov-96	Panama	S	Moss	4	Pertamina
Hyundai Oceanpia	135,000	Hyundai MM	Hyundai	Jul-00	Panama	S	Moss	4	Oman Gas
Hyundai Technopia	135,000	Hyundai MM	Hyundai	Jul-00	Panama	S	Moss	4	RasGas
Hyundai Utopia	125,182	Hyundai MM	Hyundai	Jun-94	Panama	S	Moss	4	Pertamina
Iberica Knutsen	138,000	Knutsen OAS	Daewoo	Aug-06	Norway	S	GT 96	4	Gas Natural
Ibra LNG	147,100	Oman Gas	Samsung	Jun-06	Panama	S	TK Mk. III	4	Oman LNG
Ibri LNG	145,000	Oman Gas	Mitsubishi	Jul-06	Panama	S	TK Mk. III	4	Oman LNG
Ish	137,540	National Gas Shipping	Mitsubishi Nagasaki	Nov-95	Liberia	S	Moss	5	ADGAS
K Acacia	138,017	Korea Line	Daewoo	Jan-00	Panama	S	GT NO 96	4	Oman Gas
K Freesia	135,256	Korea Line	Daewoo	Jun-00	Panama	S	GT NO 96	4	RasGas
K Jasmine	145,700	Korea Line	Daewoo	Mar-08	Panama	S	GT NO 96	4	Kogas offtake
K Mugungwha	152,000	K Line	Daewoo	Nov-08	Panama	S	GT NO 96	4	Various
Kita LNG	160,106	TMSC Gas	Daewoo	Jun-14	Malta	TFDE	GT No 96	4	Various
Kotawaka Maru	125,200	J3 Consortium	Kawasaki Sakaide	Jan-84	Japan	S	Moss	5	Darwin
Lala Fatma N'Soumer	145,000	Algeria Nippon Gas	Kawasaki Sakaide	Dec-04	Japan	S	Moss	4	Sonatrach
Larbi Ben M'Hidi	129,750	SNTM-Hyproc	La Seyne	Jun-77	Algeria	S	GT NO 85	5	Sonatrach
Lijmilya	261,700	QGTC	Daewoo	Sep-08	Marshall Is.	DRL	GT NO. 96	5	Various
LNG Abuja	126,530	Bonny Gas Transport	GD Quincy	Sep-80	Bahamas	S	Moss	5	Nigeria LNG
LNG Adamawa	141,000	Bonny Gas Transport	Hyundai	Jun-05	Bermuda	S	Moss	4	Various
LNG Akwa Ibom	141,000	Bonny Gas Transport	Hyundai	Nov-04	Bermuda	S	Moss	4	Various
LNG Aquarius	126,300	MOL/LNG Japan	GD Quincy	Jun-77	Marshall Is.	S	Moss	5	Various
LNG Barka	153,000	NYK	Kawasaki	Jan-09	Bahamas	S	Moss	4	Various
LNG Bayelsa	137,500	Bonny Gas Transport	Hyundai	Feb-03	Bermuda	S	Moss	4	Nigeria LNG
LNG Benue	145,700	BW Gas	Daewoo	Mar-06	Bermuda	S	GT NO 96	4	Nigeria LNG
LNG Bonny	177,000	Bonny Gas Transport	Hyundai	Oct-15	Bermuda	DFDE	TZ Mk III	4	Nigeria LNG
LNG Borno	149,600	NYK Line	Samsung	Aug-07	Japan	S	TZ Mk. III	4	Nigeria LNG
LNG Capricorn	126,300	MOL/LNG Japan	GD Quincy	Jun-78	Marshall Is.	S	Moss	5	Pertamina
LNG Cross River	141,000	Bonny Gas Transport	Hyundai	Sep-05	Bermuda	S	Moss	4	Various
LNG Dream	145,000	Osaka Gas	Kawasaki	Sep-06	Japan	S	Moss	4	Woodside Energy
LNG Ebisu	147,500	MOL	Kawasaki	Sep-08	Bahamas	S	Moss	4	Various
LNG Edo	126,530	Bonny Gas Transport	GD Quincy	May-80	Bahamas	S	Moss	5	Nigeria LNG
LNG Enugu	145,000	BW Gas	Daewoo	Oct-05	Bermuda	S	GT NO 96	4	Nigeria LNG
LNG Fimina	175,000	Bonny Gas Transport	Samsung	Oct-15	Bermuda	DFDE	TZ Mk III	4	Nigeria LNG
LNG Flora	127,700	J3 Consortium	Kawasaki Sakaide	Mar-93	Japan	S	Moss	4	Pertamina
LNG Fukurokuju	165,000	MOL	Kawasaki	June-15	Japan	S	Moss	4	Various
LNG Gemini	126,300	MOL/LNG Japan	GD Quincy	Sep-78	Marshall Is.	S	Moss	5	Pertamina
LNG Imo	148,300	BW Gas	Daewoo	Jun-08	Bermuda	S	GT NO 96	4	Nigeria LNG
LNG Jamal	135,330	Osaka Gas/J3 Consortium	Mitsubishi Nagasaki	Oct-00	Japan	S	Moss	5	Oman Gas
LNG Jupiter	145,000	NYK Line	Kawasaki	Jul-09	Bahamas	S	Moss	4	Various
LNG Jurojin	155,300	MOL	MHI Nagasaki	Nov-15	Japan	S	KM	4	Various
LNG Kano	148,471	BW Gas	Daewoo	Jan-07	Bermuda	S	GT No. 96	4	NLNG
LNG Lagos	177,000	Bonny Gas	Hyundai	Oct-15	Bermuda	DFDE	TZ Mk III	4	Nigeria LNG
LNG Leo	126,400	MOL/LNG Japan	GD Quincy	Dec-78	Marshall Is.	S	Moss	5	Pertamina
LNG Lerici	65,000	Exmar	Italcantieri Sestri	Mar-98	Italy	S	GT NO 96	4	Sonatrach
LNG Libra	126,400	Hoegh LNG	GD Quincy	Apr-79	Marshall Is.	S	Moss	5	Various
LNG Lokoja	148,300	BW Gas	Daewoo	Dec-06	Bermuda	S	GT No. 96	4	Nigeria LNG
LNG Ogun	148,300	NYK Line	Samsung	Aug-07	Japan	S	TZ Mk. III	4	Nigeria LNG
LNG Ondo	148,300	BW Gas	Daewoo	Sep-07	Bermuda	S	GT NO 96	4	Nigeria LNG

LNG Oyo	140,500	BW Gas	Daewoo	Dec-05	Bermuda	S	GT NO 96	4	Nigeria LNG
LNG Pioneer	138,000	MOL	Daewoo	Jul-05	Bahamas	S	GT No 96	4	Idku
LNG Port Harcourt	175,000	Bonny Gas	Samsung	Oct-15	Bermuda	DFDE	TZ Mk III	4	Nigeria LNG
LNG Portovenere	65,000	Exmar	Italcantieri Sestri	Jun-96	Italy	S	GT No 96	4	Sonatrach
LNG River Niger	141,000	Bonny Gas Transport	Hyundai	May-06	Bermuda	S	Moss	4	Various
LNG River Orashi	145,910	BW Gas	Daewoo	Nov-04	Bermuda	S	GT No 96	4	Nigeria LNG
LNG Rivers	137,231	Bonny Gas Transport	Hyundai	Jun-02	Bermuda	S	Moss	4	Nigeria LNG
LNG Saturn	153,000	MOL	MHI	Nov-15	Japan	S	Moss	4	Various
LNG Sokoto	137,231	Bonny Gas Transport	Hyundai	Aug-02	Bermuda	S	Moss	4	Nigeria LNG
LNG Taurus	126,300	MOL/LNG Japan	GD Quincy	Aug-79	Marshall Is.	S	Moss	5	Various
LNG Venus	155,000	Osaka/MOL	MHI	Oct-14	Japan	S	Moss	4	Various
LNG Vesta	127,547	Tokyo Gas Consortium	Mitsubishi Nagasaki	Jun-94	Japan	S	Moss	4	Pertamina
LNG Virgo	126,400	MOL/LNG Japan	GD Quincy	Dec-79	Marshall Is.	S	Moss	5	Pertamina
Lobito	160,400	Mitsui/NYK/Teekay	Samsung	Oct-11	Bahamas	DFDE	TZ Mk. III	4	Various
Lusail	138,000	Peninsular LNG	Samsung	May-05	Bahamas	S	TZ Mk. III	4	Qatar
Madrid Spirit	138,000	Teekay LNG Partners	IZAR Puerto Real	Jan-05	Spain	S	GT No 96	4	Engas
Magellan Spirit	165,500	Teekay LNG Partners	Samsung	Sep-08	Denmark	DFDE	TZ Mk. III	4	Various
Malanje	160,400	Mitsui/NYK/Teekay	Samsung	Jul-11	Bahamas	DFDE	TZ Mk. III	4	Various
Maran Gas Alexandria	161,870	Maran	Hyundai Samho	Sep-15	Greece	DFDE	TZ Mk. III	4	Various
Maran Gas Apollonia	161,870	Maran	Daewoo	Jan-14	Greece	DFDE	GT No 96	4	Various
Maran Gas Asclepius	145,000	Kristen Navigation	Daewoo	Jul-05	Bermuda	S	GT No 96	4	Qatar
Maran Gas Coronis	145,700	Maran	Daewoo	Sep-07	Greece	S	GT No 96	4	Rasgas II
Maran Gas Delphi	159,800	Maran	Daewoo	Feb-14	Greece	DFDE	GT No 96	4	Various
Maran Gas Efessos	159,800	Maran	Daewoo	Jun-14	Greece	DFDE	GT No 96	4	Various
Maran Gas Lindos	159,800	Maran	Daewoo	Jun-15	Greece	DFDE	GT No. 96	4	Various
Maran Gas Mystras	155,900	Maran Gas	Daewoo	May-15	Greece	DFDE	GT No 96	4	various
Maran Gas Posidonia	161,870	Maran	Daewoo	May-14	Greece	DFDE	GT No 96	4	Various
Maran Gas Sparta	161,870	Maran	Hyundai Samho	April-15	Greece	DFDE	G TZ Mk. III	4	Various
Maran Gas Troy	155,900	Maran Gas	Daewoo	May-15	Greece	DFDE	GT No 96	4	various
Maria Energy	174,000	Tsakos	Hyundai	Mar-15	Marshall Is.	TFDE	GTT Mk II	4	Various
Marib Spirit	165,000	Teekay LNG	Samsung	May-08	Marshall Is.	DFDE	TZ Mk. III	4	Various
Matthew	126,540	Suez LNG Shiping	Newport News	Jun-79	Bahamas	S	TZ Mk. I	6	Atlantic LNG
Mekaines	266,000	Naklilat	Samsung	Mar-09	Liberia	DRL	GT No 96	4	Qatar-Atlantic Basin
Meridian Spirit	165,500	Teekay LNG	Samsung	Jan-10	Denmark	DFDE	TZ Mk. III	4	Various
Mesaimeer	210,100	Naklilat	Hyundai	Mar-09	Liberia	DRL	GT No 96	4	Qatar-Atlantic Basin
Methane Alison Victoria	145,000	GasLog	Samsung	Aug-07	Bermuda	S	TZ III	4	Eq.Guinea LNG
Methane Becki Anne	170,000	GasLog	Samsung	Sep-10	Bermuda	TFDE	TZ Mk. III	4	Various
Methane Heather Sally	145,000	GasLog	Samsung	Jul-07	Bermuda	S	Tz Mk. III	4	Eq.Guinea LNG
Methane Jane Elizabeth	145,000	GasLog	Samsung	Jun-06	Bermuda	TFDE	TZ Mk. III	4	Engas
Methane Julia Louise	170,000	GasLog	Samsung	Dec-09	Bermuda	TFDE	TZ Mk. III	4	Various
Methane Kari Elin	138,200	Shell	Samsung	Jun-04	Bermuda	S	TZ Mk. III	4	Various
Methane Lake Charles	145,000	Shell	Samsung	Feb-07	Bermuda	S	TZ Mk. III	4	Marathon Oil
Methane Lydon Volney	145,000	Shell	Samsung	Aug-06	Bermuda	S	TZ Mk. III	4	Engas
Methane Mickie Harper	170,000	Shell-GasLog	Samsung	Nov-10	Bermuda	TFDE	TZ Mk. III	4	Various
Methane Nile Eagle	145,000	Shell-GasLog	Samsung	Dec-07	Bermuda	S	TZ Mk. III	4	Engas
Methane Patricia Camila	170,000	Shell-GasLog	Samsung	Oct-10	Bermuda	TFDE	TZ Mk. III	4	Various
Methane Princess	138,159	Golar LNG	Daewoo	2003	UK	S	GT No 96	4	Spot BG
Methane Rita Andre	145,000	GasLog	Samsung	Mar-06	Bermuda	S	TZ Mk. III	4	Engas
Methane Shirley Elizabeth	145,000	GasLog	Samsung	Apr-07	Bermuda	S	TZ Mk. III	4	Marathon Oil
Methane Sprit	165,000	Teekay LNG	Samsung	Mar-08	Singapore	DFDE	TZ Mk. III	4	Various
Methania	131,230	Distrigas	Boelwerf	Oct-78	Belgium	S	GT No 85	5	Sonatrach
Milaha Qatar	145,000	Milaha	Samsung	Apr-06	Denmark	S	TZ Mk. III	4	Qatar
Milaha Ras Laffan	138,270	Milaha	Samsung	Mar-04	Denmark	S	TZ Mk. III	4	RasGas II
Min Lu	147,000	China Ships	Hudong	Aug-09	China	S	GT No 96	4	Various
Min Rong	147,000	China LNG Ships	Hudong	Feb-09	Hong Kong	S	GT No 96	4	Australia-China
Mostefa Ben Boulaid	125,260	SNTM-Hyproc	La Ciotat	Aug-76	Algeria	S	TZ Mk. I	6	Sonatrach
Mourad Didouche	126,130	SNTM-Hyproc	Atlantique	Jul-80	Algeria	S	GT No 85	5	Sonatrach
Mozah	266,000	QGTC	Samsung	Aug-08	Qatar	DRL	TZ Mk III	5	Qatargas II
Mraweh	137,000	National Gas Shipping	Kvaerner-Masa	Jun-96	Liberia	S	Moss	4	ADGAS
Mubaraz	137,000	National Gas Shipping	Kvaerner-Masa	Jan-96	Liberia	S	Moss	4	Various
Muraq	210,100	J5-K Line	Daewoo	May-08	Marshall Is.	DRL	GT No 96	4	Qatar-Atl'c Basin
Murwab	210,100	J5 Consortium	Daewoo	May-08	Marshall Is.	DRL	GT No. 96	4	Qatargas
Muscat LNG	149,170	Oman Gas/MOL	Kawasaki Sakaide	Mar-04	Japan	S	Moss	4	Oman Gas
Neo Energy	149,700	Tsakos	Hyundai	Feb-07	Liberia	S	GTT Mk II	4	Various
Nizwah LNG	145,000	Oryx LNG Carriers	Kawasaki Sakaide	Dec-05	Japan	S	Moss	4	Oman Gas
Northwest Sanderling	127,525	Australia LNG	Mitsubishi Nagasaki	Jun-89	Australia	S	Moss	4	NWS
Northwest Sandpiper	127,500	Australia LNG	Mitsui Chiba	Feb-93	Australia	S	Moss	4	NWS
Northwest Seaeagle	127,450	Australia LNG	Mitsubishi Nagasaki	Nov-92	Bermuda	S	Moss	4	NWS
Northwest Shearwater	127,500	Australia LNG	Kawasaki Sakaide	Sep-91	Bermuda	S	Moss	4	NWS
Northwest Snipe	127,747	Australia LNG	Mitsui Chiba	Sep-90	Australia	S	Moss	4	NWS
Northwest Stormpetrel	127,600	Australia LNG	Mitsubishi Nagasaki	Dec-94	Australia	S	Moss	4	NWS
Northwest Swallow	127,708	J3 Consortium	Mitsui Chiba	Nov-89	Japan	S	Moss	4	NWS
Northwest Swan	138,000	Australia LNG	Daewoo	Mar-04	Australia	S	GT NO 96	4	NWS
Northwest Swift	127,590	J3 Consortium	Mitsubishi Nagasaki	Sep-89	Japan	S	Moss	4	NWS
Ob River	150,000	Lance Shipping	Hyundai	Oct-07	Marshall Is.	S	TZ Mk. III	4	Various
Onaiza	210,100	Nakilat	Daewoo	Apr-09	Liberia	DRL	GT NO 96	4	Qatar-Atlantic Basin
Pacific Arcadia	147,200	NYK Line	MHI	Oct-14	Bahamas	S	KM		Various
Pacific Enlighten	145,000	LNG MT	Mitsubishi	Mar-09	Japan	S	Moss	4	Various
Pacific Eurus	137,000	LNG Marine Transport	Mitsubishi Nagasaki	Mar-06	Bahamas	S	Moss	4	Darwin
Pacific Notus	137,006	Pacific LNG Shipping	Mitsubishi Nagasaki	Sep-03	Bahamas	S	Moss	5	Darwin
Palu LNG	160,106	TMSC Gas	Daewoo	Jun-14	Malta	TFDE	GT No 96	4	Various
Papua	171,800	MOL-China	Hudong	Jan-15	Hong Kong	DFDE	SSD	4	PNG LNG
Polar Eagle	89,880	Polar LNG	IHI Chita	Jun-93	Liberia	S	IHI SPB	4	ConocoPhillips/Marathon
Provalys	153,500	Gaz de France	Chantiers	Nov-06	France	DFDE	CS1	4	ELNG

Puteri Delima	130,400	MISC	Atlantique	Jan-95	Malaysia	S	GT NO 96	4	Petronas
Puteri Delima Satu	137,100	MISC	Mitsui Chiba	Apr-02	Malaysia	S	GT NO 96	4	Petronas
Puteri Firuz	130,400	MISC	Atlantique	May-97	Malaysia	S	GT NO 96	4	Petronas
Puteri Firuz Satu	137,100	MISC	Mitsubishi Nagasaki	Sep-04	Malaysia	S	GT NO 96	4	Petronas
Puteri Intan	130,400	MISC	Atlantique	Aug-94	Malaysia	S	GT NO 96	4	Petronas
Puteri Intan Satu	137,100	MISC	Mitsubishi Nagasaki	Dec-01	Malaysia	S	GT NO 96	4	Petronas
Puteri Mutiera Satu	137,100	MISC	Mitsui Chiba	Apr-05	Malaysia	S	GT NO 96	4	Petronas
Puteri Nilam	130,400	MISC	Atlantique	Jun-95	Malaysia	S	GT NO 96	4	Petronas
Puteri Nilam Satu	137,100	MISC	Mitsubishi Nagasaki	Sep-03	Malaysia	S	GT NO 96	4	Petronas
Puteri Zamrud	130,400	MISC	Atlantique	May-96	Malaysia	S	GT NO 96	4	Petronas
Puteri Zamrud Satu	137,100	MISC	Mitsui Chiba	Apr-87	Malaysia	S	GT NO 96	4	Atlantic LNG
Raahi	136,000	Petronet LNG Ltd	Daewoo	Dec-04	Malta	S	GT NO 96	4	Qatargas
Ramdane Abane	126,130	SNTM-Hyproc	Atlantique	Jul-81	Algeria	S	GT NO 85	5	Sonatrach
Rasheeda	266,000	QGTC	Samsung	Jun-10	Liberia	DRL	TZ Mk. III		Various
Ribera del Duero Knutsen	173,400	Knutsen	Daewoo	Nov-10	Nor-NIS	DFDE	GT NO. 96	4	Various
Salalah LNG	147,000	Oman Gas/MOL	Samsung	Dec-05	Japan	S	TZ Mk. III	4	Oman
SCF Polar	71,500	Sovcomflot	Kockums	Aug-69	Liberia	S	GT NO 82	6	Sonatrach
Seishu Maru	162,000	K Line-Transpacific	Kawasaki Sakaide	Jan-15	Panama	S	Moss	4	Australia-Japan
Seri Alam	138,000	MISC	Samsung	Oct-05	Malaysia	S	TZ Mk. III	4	Yemen LNG
Seri Amanah	145,000	MISC	Samsung	Mar-06	Malaysia	S	TZ Mk. III	4	Yemen LNG
Seri Anggun	145,000	MISC	Samsung	Nov-06	Malaysia	S	TZ Mk. III	4	Yemen LNG
Seri Angkasa	145,000	MISC	Samsung	Feb-07	Malaysia	S	TZ Mk. III	4	Petronas
Seri Ayu	145,000	MISC	Samsung	Oct-07	Malaysia	S	TZ Mk. III	4	Various
Seri Bakti	152,300	MISC	Mitsubishi	Mar-07	Malaysia	S	GT NO 96	4	Petronas
Seri Balhaf	152,000	MISC	Mitsubishi	Sep-08	Malaysia	S	GT NO 96	4	Various
Seri Balquis	152,000	MISC	Mitsubishi	Dec-08	Malaysia	S	GT NO 96	4	Various
Seri Begawan	152,300	MISC	Mitsubishi	Dec-07	Malaysia	S	GT NO 96	4	Various
Seri Bijaksana	152,300	MISC	Mitsubishi	Feb-08	Malaysia	S	GT NO 96	4	Petronas
Sevilla Knutsen	173,400	Knutsen	Daewoo	Jun-10	N.I.S.	DFDE	GT NO 96	4	Various
Shahamah	135,500	National Gas Shipping	Kawasaki Sakaide	Oct-94	Liberia	S	Moss	5	ADGAS
Shangra	266,000	QGTC	Samsung	Nov-09	Liberia	DRL	TZ Mk. III	5	Qatargas IV
Shen Hai	147,100	China LNG	Hudong Zhonghua	Sep-12	China	AB/CC Steam	GT NO 96	4	Various
Simaisma	147,700	Maran Gas Maritime	Daewoo	Jul-06	Greece	S	GT No 96	4	Qatar
SK Splendor	138,375	SK Shipping	Samsung	Mar-00	Panama	S	TZ Mk. III	4	Oman Gas
SK Stellar	138,375	SK Shipping	Samsung	Dec-00	Panama	S	TZ Mk. III	4	RasGas
SK Summit	138,000	SK Shipping	Daewoo	Aug-99	Panama	S	GT NO 96	4	RasGas
SK Sunrise	138,306	I. S. Carriers	Samsung	Sep-03	Panama	S	TZ Mk. III	4	RasGas
SK Supreme	138,200	SK Shipping	Samsung	Jan-00	Panama	S	TZ Mk. III	4	RasGas
Sohar LNG	137,250	Oman Gas/ MOL	Mitsubishi Nagasaki	Oct-01	Malta	S	Moss	5	Oman Gas
Solaris	155,000	GasLog	Samsung	Jul-14	Bermuda	TFDE	TZ Mk. III	4	Various
Sonangol Benguela	160,500	Sonangol	Daewoo	Sep-11	Bahamas	S	GT No. 96	4	Angola LNG
Sonangol Etosha	160,500	Sonangol	Daewoo	Sep-11	Bahamas	S	GT No. 96	4	Angola LNG
Sonangol Sambizanga	160,500	Sonangol	Daewoo	Sep-11	Bahamas	S	GT No. 96	4	Angola LNG
Southern Cross	172,000	MOL	Hudong	May-15	Hong Kong	DRL	GT NO. 96	4	Various
Soyo	160,400	Mitsui/NYK/Teekay	Samsung	May-11	Bahamas	DFDE	TZ Mk. III	4	Various
Spirit of Hela	177,000	MOL	Hyundai	Oct-09	Panama	DFDE	TZ Mk. III	4	Various
Stena Blue Sky	145,700	Stena	Daewoo	Jan-06	Panama	S	GT No 96	4	Various
Stena Clear Sky	171,800	Stena	Daewoo	Sep-10	Panama	DFDE	GT NO 96	4	Various
Stena Crystal Sky	171,800	Stena	Daewoo	Jul-10	Panama	DFDE	GT NO 96	4	Various
STX Kolt	145,700	STX Panocean	Korea Hanjin	Nov-08	Panama	DFDE	TZ Mk. III	4	Various
Suez Point Fortin	154,200	Trinity LNG	Koyo Japan	Nov-09	Panama	S	TZ Mk. III	4	Yemen LNG
Taitar No. 1	145,000	NYK Line	Mitsubishi	Oct-09	Liberia	S	Moss	4	Various
Taitar No. 3	145,000	NYK Line	Mitsubishi	Jan-10	Liberia	S	Moss	4	Various
Taitar No. 4	145,000	NYK	Mitsubishi	Jan-10	Liberia	S	Moss	4	Various
Tangguh Batur	145,700	Sovcomflot/NYK	Daewoo	Dec-08	Cyprus	S	GT NO 96		Tangguh
Tangguh Foja	155,000	K Line	Samsung	Jul-08	Panama	DFDE	TZ Mk. III	4	Tangguh LNG
Tangguh Hiri	155,000	Teekay LNG	Hyundai	Nov-08	IOM	DFDE	TZ Mk. III	4	Tangguh
Tangguh Jaya	145,700	K Line	Samsung	Nov-08	Panama	DFDE	TZ Mk. III	4	Tangguh
Tangguh Palung	155,000	K Line	Samsung	Mar-09	Panama	DFDE	TZ Mk. III	4	Tangguh
Tangguh Sago	155,000	Teekay LNG	Hyundai	Mar-09	IOM	DFDE	TZ Mk. III	4	Tangguh LNG
Tangguh Towuti	145,700	Sovcomflot/NYK	Daewoo	Oct-08	Cyprus	S	GT NO 96	4	Tangguh
Tembek	216,200	OSG/Nakilat	Samsung	Sep-07	Marshall Is.	DRL	TZ Mk. III	4	Qatargas II
Tenaga Satu	130,000	MISC	Dunkerque	Sep-82	Malaysia	S	GT NO 88	5	Petronas
Trinity Arrow	154,900	K Line	Imabari Shipbuilding	Mar-08	Panama	S	TZ Mk. III	4	Various
Umm Al Amad	210,100	J5	Daewoo	Aug-08	Marshall Is.	DRL	GT NO 96	4	Ras Gas III
Umm Al Ashtan	137,000	National Gas Shipping	Kvaerner- Masa	May-97	Liberia	S	Moss	4	ADGAS
Umm Bab	145,000	Kristen Navigation	Daewoo	Nov-05	Bermuda	S	GT NO 96	4	Qatargas
Umm Slaal	266,000	QGTC	Samsung	Nov-08	Qatar	DRL	TZ Mk. III	5	Qatargas
Valencia Knutsen	173,400	Knutsen	Daewoo	Sep-10	Nor-NIS	DFDE	GT NO. 96	4	Various
Velikiy Novgorod	170,200	SovComFlot	STX	Feb-14	Liberia	DFDE	GT No. 96	4	Various
Wakaba Maru	125,000	J3 Consortium	Mitsui Chiba	Apr-85	Japan	S	Moss	5	Pertamina
WilEnergy	125,500	Awilco LNG	Mitsubishi	Oct-83	NIS	S	Moss	5	Various
WilForce	156,000	Teekay LNG	Daewoo	Aug-13	NIS	DFDE	GT NO 96	4	Various
WilGas	125,500	Awilco LNG	Mitsubishi	Jul-84	NIS	S	Moss	5	Various
WilPower	125,500	Awilco LNG	Mitsubishi	Jul-84	NIS	S	Moss	5	Various
Woodside Donaldson	165,500	Teekay LNG	Samsung	Dec-09	Singapore	DFDE	TZ Mk. III	4	Various
Woodside Goode	159,800	Maran	Daewoo	Jul-14	Greece	DFDE	GT No. 96	4	Various
Woodside Rogers	155,900	Maran Gas	DSME	Jul-13	Greece	DFDE	GT NO 96	4	Various
Yari LNG	159,983	TMSC Gas	Daewoo	Jun-14	Malta	TFDE	GT No 96	4	Various
Yenisei River	155,000	Dynagas	Hyundai	Jul-13	Marshall Is.	DFDE	TZ Mk. III	4	Various
YK Sovereign	127,125	SK Shipping	Hyundai	Dec-94	Panama	S	Moss	4	Pertamina
Zarga	266,000	QGTC	Samsung	Dec-09	Liberia	DRL	TZ Mk. III	5	Qatar-Atlantic
Zekreet	135,420	J4 Consortium	Mitsui Chiba	Dec-98	Japan	S	Moss	5	Qatargas

Any observations, additions or suggested revisions to the LNG journal World LNG Carrier Fleet list should be sent to editor@lngjournal.com

LNG Import Terminals

Explanatory Notes

- The tables do not include the following types of LNG facilities :
  - Small marine satellite terminals receiving LNG from liquefaction plants in their own country (such as exist in Norway) or which receive LNG transhipped from nearby reception terminals in their own country (such as in Japan)
  - Satellite LNG storage facilities that receive LNG transported only by road or rail
- Expansions of LNG reception terminals are only shown if they involve new storage tanks
- Where there is a blank in the table the information is uncertain or unknown.

Any comments on the tables, and corrections / additional information from terminal shareholders and project developers would be most welcome, and should be sent to John McKay e-mail editor@lngjournal.com

Country	Location (Project)	Owners	Start up	Storage Tanks	Storage Capacity
Belgium	Zeebrugge	Fluxys	1987	4	380,000
Canada	Canaport Saint John	Irving Oil, Repsol	2009	3	480,000
Chile	Quintero	ENAP, Metrogas, Enagas	2009	3	334,000
	Mejillones	Engie, Codelco	2010	1	175,000
China	Beihai LNG, Guangxi	Sinopec	2015	2	320,000
	Dalian	PetroChina	2011	3	480,000
	Dongguan, Guangdong	Jovo Group	2013	2	160 000
	Fujian LNG (Xiuyu)	CNOOC, Fujian I&D Corp.	2008	2	640,000
	Guangdong	CNOOC,BP	2006	3	480,000
	Haikou, Hainan LNG	CNOOC	2014	3	480,000
	Ningbo, Zheijang	CNOOC, Zhejiang Energy	2012	3	480,000
	Qingdao, Shandong	Sinopec	2014	3	480,000
	Rudong	PetroChina	2011	2	320,000
	Shanghai	CNOOC, Shenergy Group	2009	3	495,000
	Shanghai, Mengtougou	Shanghai Gas	2008	3	120 000
	Tangshan, Hebei	PetroChina	2013	3	480,000
	Tianjin FSRU	CNOOC	2014	1	60,000
	Zhuhai, Gaolan	CNOOC	2013	3	480,000
Dominican Republic	Punta Caucedo	AES Andres	2003	1	160 000
France	Fos Tonkin	Elengy	1972	3	150,000
	Montoir-de-Bretagne	Elengy	1980	3	360,000
	Fos Cavaou	Engie, Total	2010	3	330,000
Greece	Revithoussa	DEPA	2000	2	130,000
India	Dabhol	GAIL, NTPC (Ratnagiri Gas & Power)	2009	3	480,000
	Dahej	Petronet LNG	2004	4	592,000
	Hazira	Shell India, Total	2005	2	320,000
	Kochi, Kerala	Petronet LNG	2013	2	320,000
Indonesia	Arun	Pertamina	2015	5	507,000
Italy	Panigaglia	Snam	1969	2	100,000
	Porto Levante (offshore GBS)	ExxonMobil, Qatar Petroleum, Edison Gas	2009	2	250,000
Japan	Negishi	Tokyo Gas	1969	14	1,180,000
	Sodegaura	Tokyo Gas	1973	35	2,660,000
	Ohgishima	Tokyo Gas	1998	4	850,000
	Higashi-Ohgishima	Tokyo Electric	1984	9	540,000
	Futtsu	Tokyo Electric	1985	10	1,110,000
	Yokkaichi LNG	Chubu Electric	1988	4	320,000
	Kawagoe	Chubu Electric	1997	6	840,000
	Yokkaichi Works	Toho Gas	1991	2	160,000
	Chita LNG Joint	Toho Gas, Chubu Electric	1978	4	300,000
	Chita LNG	Toho Gas, Chubu Electric	1983	7	640,000
	Chita - Midorihama	Toho Gas	2001	2	400,000
	Senboku I	Osaka Gas	1972	4	180,000
	Senboku II	Osaka Gas	1977	18	1,585,000
	Himeji	Osaka Gas	1984	8	740,000
	Himeji LNG	Kansai Electric	1979	7	520,000
	Yanai	Chugoku Electric	1990	6	480,000
	Niigata	Nihonkai LNG, Tohoku Electric	1984	8	720,000
	Oita	Oita Gas, Kyushu Electric	1990	5	460,000
	Tobata	Kitakyushu LNG	1977	8	480,000
	Fukuoka	Saibu Gas	1993	2	70,000
	Sodeshi	Shizuoka Gas	1996	3	337,200
	Hatsukaichi	Hiroshima Gas	1996	2	170,000
	Kagoshima	Nippon Gas	1996	2	136,000
	Shin-Minato	Sendai City Gas	1997	1	80,000
	Nagasaki	Saibu Gas	2003	1	36,000
	Sakai	Kansai Electric, Cosmo OII	2006	3	420,000
	Mizushima	Nippon Oil, Chugoku Electric	2006	2	320,000
	Sakaide	Shikoku Electric, Cosmo Oil	2011	1	180,000
	Ishikari LNG	Hokkaido Gas, Tokyo Gas	2012	1	180,000
	Okinawa	Okinawa Electric Power	2012	2	280,000
	Naoetsu	Inpex	2013	2	360,000
	Joetsu	Chubu	2011	3	540,000
	Hachinohe LNG	Nippon Oil	2015	2	280,000
	Hitachi LNG	Tokyo Gas	2015	1	230,000
Korea	Incheon	Kogas	1996	20	2,880,000
	Kwangyang	POSCO	2005	4	530,000
	Pyeong-Taek	Kogas	1986	23	3,360,000
	Samcheok	Kogas	2014	3	600,000
	Tong-Yeong	Kogas	2002	17	2,620,000
Mexico	Altamira	Vopak, Enagas	2006	2	300,000
	Energia Costa Azul	Sempra LNG	2008	2	320,000
	Manzanillo	Samsung, Kogas, Mitsui	2012	2	300,000
Netherlands	Gate LNG	Gasunie, Royal Vopak	2011	3	540,000
Poland	Swinoujscie	Baltic Gaz System	2015	2	320,000
Portugal	Sines	REN Atlantico	2004	3	390,000
Puerto Rico	Penuelas	EcoElectrica	2000	1	160,000
Singapore	Singapore	Singapore Energy Authority	2013	3	540,000

LNG Import Terminals (continued)

Country	Location (Project)	Owners	Start up	Storage Tanks	Storage Capacity
Spain	Barcelona	Enagas	1969	8	840,000
	Huelva	Enagas	1988	5	610,000
	Cartagena	Enagas	1989	5	587,000
	Bilbao	Enagas, EVE	2003	3	450,000
	Sagunto	GNF, Osaka Gas, Oman Oil	2006	4	600,000
	Reganosa, Ferrol	GNF, Sonatrach, Tojeiro	2006	2	300,000
	El Musel, Gijón,	Enagas	2013	2	300,000
Taiwan	Yung-An	CPC	1990	6	690,000
	Tai-chung	CPC	2009	3	480,000
Thailand	Map Ta Phut	PTT LNG	2011	2	320,000
Turkey	Marmara Ereglisi	Botas	1994	3	255,000
	Izmir	EgeGaz	2006	2	280,000
USA	Everett	Suez LNG NA	1971	2	155,000
	Lake Charles	Shell, ETE	1982	4	425,000
	Elba Island	Kinder	2001	5	535,000
	Cove Point	Dominion	2003	5	530,000
	Freeport	Freeport LNG Development	2008	2	320,000
	Cameron	Sempra LNG	2009	3	480,000
	Golden Pass, TX	Qatar Petroleum, ExxonMobil	2010	5	775,000
	Pascagoula, MS	Gulf LNG, Kinder	2012	2	320,000
UK	Isle of Grain	National Grid	2005	8	1,000,000
	South Hook	ExxonMobil, Qatar Petroleum,Total	2009	5	775,000
	Dragon LNG, Milford Haven	Shell, Petronas	2009	2	310,000

LNG Import Terminal Projects

Country	Location/Project	Owners/Project Developers	Start up	Storage Tanks	Storage Capacity
China	Swatuo, Guangdong	CNOOC	2016	2	320,000
	Yingkou, Liaoning	CNOOC	2016	2	320,000
	Qidong, Jiangsu	Shell-Guanghui	studies		
	Yuedong LNG, Jieyang, Guangdong	CNOOC	2016	2	320,000
Finland	Pori	Gasum Skangass	2016	1	30,000
	Tornio	Gasum, Skangass	2018	1	30,000
France	Dunkirk LNG	LNG EDF, Fluxys, Total	2016	3	570,000
India	Ennore	Indian Oil Corp	2016	2	320,000
	Mundra	Gujarat State Petroleum, Adani Group	2016	2	320,000
	FSRU Andhra Pradesh	Engie, Andhra Pradesh Gas	2016	1	135,000
	Pipovav LNG (FSRU), Gujarat	Swan Energy	2016	2	320,000
Indonesia	Labuhan Maringgai	Perusahaan Gas Negara	2016	1	135,000
Japan	Soma, Fukushima	Japan Petroleum	2017	1	230,000
Malaysia	Lahad Datu LNG, Sabah	Petronas	2016	studies	
Philippines	Pagbilao LNG	Energy World Corp.	2016	1	130,000
UAE (FSRU)	Fujairah	Mubadala	2016	1	135,000
UK	Port Meridian, Barrow-in-Furness	Port Meridian Energy Ltd.	2016	1	150,000
Uruguay FSRU	Montevideo	Gas Sayago, Mitsui Osk Lines	2017	1	230,000

LNG FSRU Import Facilities

Country	Location (Project)	Owners	Start up
Argentina	Bahia Blanca GasPort	Excelerate/YPF Repsol	2008
	Escobar GasPort	Excelerate/Enarsa	2011
Brazil	Pecem, FSRU	Petrobras	2009
	Guanabara Bay FSRU	Petrobras	2009
	Salvador, Bahia FSRU	Petrobras	2013
Dubai	Jebel Ali Port	DSA of UAE	2010
Egypt	Ain Sokhna, Suez	EGAS, Hoegh	2015
	Ain Sokhna, Suez	EGAS, Golar	2015
Indonesia	Lampung	Hoegh LNG, PGN LNG	2014
	Nusantara (Jakarta Bay)	Golar LNG, Pertimana	2012
Italy	Livorno	OLT Offshore LNG Toscana	2013
Jordan	Aqaba, Jordan	Golar LNG	2015
Kuwait	Mina Al-Ahmadi	KPC	2009
Lithuania	Klaipeda	Klaipedos Nafta Hoegh LNG	2014
Malaysia	Malacca FSRU	Petronas	2012
Pakistan	Port Qasim	Excelerate, Engro Corp	2015
UK	Teesside GasPort	Excelerate	2007

LNG Export Projects

Country	Location/Project	Project Developers	Planned Start Up	Number of Trains	Capacity In MTPA
AUSTRALIA	Browse LNG	Woodside, BHP, BP Chevron, Shell, Mitsubishi, Mitsui	2018+	2	10.0
	Ichthys LNG	INPEX, Total	2017	2	8.4
	Prelude FLNG	Shell, Inpex, Kogas CPC	2017	1	3.5
	Sunrise LNG	Woodside, Osaka Gas, ConocoPhillips, Shell	2020+	1	3.5
	Wheatstone LNG	Chevron, Apache, Shell , Kuwait FPEC	2017	2	9.0
CANADA	Aurora LNG BC	CNOOC, Inpex Corp. and JGC Corp.	2020	4	24.0
	Bear Head LNG, Nova Scotia	LNG Ltd.	2020	4	8.0
	Canaport LNG, New Brunswick	Repsol Irving Oil	2020	studies	
	Cedar 1, 2, 3, Kitimat area	LNG Export Ltd (Haisla)	2020	studies	
	Douglas Channel LNG Bish Cove	Exmar, EDF, ltaGas, Idemitsu	2018	1	1.0
	GNL Quebec, Saquenay	Freestone Capital and Breyer Capital	2020	4	10.0
	Goldboro LNG, Nova Scotia	Pieridae Energy	2020	2	10.0
	Grassy Point LNG	Woodside Petroleum	2020	studies	
	Kitimat LNG, BC	Woodside, Chevron	2020	2	10.0
	LNG Canada, BC	Shell, Mitsubishi, Kogas, PetroChina	2020	2	12.0
	Melford LNG project, Nova Scotia	H-Energy Hiranandani Group	Studies		
	Pacific Northwest LNG, BC	Petronas, Japex, Sinopec, Indian Oil, Brunei Petroleum	2019	2	12.0
	Shell Prince Rupert LNG,BC	Shell	2020	3	21.0
	Steelhead LNG, Bamfield	Steelhead LNG Corp	2020	2	12.00
	Vancouver Tilbury	WesPac Midstream	2020	1	3.25
EQ.GUINEA	Equatorial Guinea Fortuna FLNG	Ophir and Golar LNG	2019	1	2.0
INDONESIA	Abadi FLNG	Inpex, Shell	2019	2	7.5
	Sengkang LNG	Energy World Corp.	2016	4	2.0
MALAYSIA	Bintulu Train 9	Petronas	2016	1	3.6
	Kanowit FLNG (Sarawak)	Petronas	2016	1	1.2
	Rotan FLNG (Sabah)	Petronas	2017	1	1.5
MOZAMBIQUE	Area 1 Onshore	Anadarko Petroleum and partners	2018	2	10
	Area 4 Onshore	Eni and partners	2020	2	10
	Area 4 FLNG	Eni and partners	2019	1	2.5
NIGERIA	NLNG Train 7	NNPC, Shell, BP, Total	2020+	1	8.4
	Olokola LNG	NNPC, Chevron, Shell	2020+	4	20.0
PAPUA NEW GUINEA	Elk-Antelope LNG	Total, InterOil, Oil Search, Petromin	Studies		
RUSSIA	Shtokman LNG Murmansk	Gazprom, Statoil, Total	2019	4	20.0
	Yamal LNG Siberia	Novatek, Gazprom, Total	2018	3	16.5
	Sakhalin II expansion	Gazprom, Shell, Mitsui, Mitsubishi	2017+	studies	
	Vladisvostok LNG	Gazprom, Itochu, various	2018	2	10.0
USA	Alaska LNG Nikiski	ExxonMobil, BP, ConocoPhillips, Alaska State	2020	3	20.0
	Annova LNG, Brownsville	Exelon Corp.	2020	6	6.0
	Cameron LNG, Louisiana	Sempra	2018	5	24.92
	Corpus Christi Liquefaction, Texas	Cheniere	2019	5	22.5
	Cove Point LNG, Maryland	Dominion	2018	1	5.25
	Delfin LNG Louisiana	Delfin, Hoegh	2020	3	9.0
	Freeport LNG, Texas	Freeport LNG	2018	4	20.4
	Golden Pass, Texas	Qatar Petroleum, ExxonMobil	2020	3	15.6
	Jordan Cove Energy	Veresen Inc.	2020	2	6.8
	Lake Charles, Louisiana	Shell, ETE	2019	3	15.0
	Live Oak LNG	Parallax	2020	1	5.0
	Louisiana LNG Energy (Mississippi R.)	Parallax, Cheniere	2020	3	6.0
	Magnolia LNG	Louisiana LNG Ltd.	2019	4	8.0
	Oregon LNG	Leucadia Corp.	2020	2	9.6
	Port Arthur LNG	Sempra	2020	2	10.0
	Rio Grande LNG	NextDecade	2020	6	27.0
	Sabine Pass LNG, Louisiana	Cheniere	2016-19	5	22.5
	Southern LNG	Kinder Morgan	2019	4	2.0
	Texas LNG Brownsville	Chandra, Meyer, Samsung, others	2020	2	4.0
	VG LNG (Cameron Parish)	Venture Global	2019	10	10.0
	VG LNG (Plaquemines)	Venture Global	2019	10	20

LNG Exporters

Country	Location/Project	Shareholders	Start up	Liquefaction		Storage	
				Trains	capacity (nominal) mtpa	No. of tanks	Total capacity m^3
ABU DHABI (UAE)	Das Island (Adgas)	ADNOC, Mitsui, BP, Total	1977	2	3.2	3	240,000
			1994	1	2.5		
ALGERIA	Arzew	Sonatrach GL4Z	1964	3	1.1	3	35,000
	Arzew	Sonatrach GL1Z	1978	6	7.8	3	300,000
	Arzew	Sonatrach GL2Z	1980	6	8.0	3	300,000
	Arzew	Sonatrach	2014	1	4.7		
	Skikda	Sonatrach GL1K II	1980	3	3.0	5	308,000
	Skikda	Sonatrach (rebuild)	2013	1	4.5		
ANGOLA	Soyo	Sonangol, Chevron, BP, ENI, Total	2012	1	5.2	2	370,000
AUSTRALIA	Karratha	NWS Woodside, Shell, BHP	1989	2	5.0	4	260,000
		(BP, Chevron	1992	1	2.5	1	130,000
		(Mistubishi/Mitsui)	2004	1	4.4	1	130,000
		NWS partners	2008	1	4.4	1	130,000
	Darwin	Darwin (Bayu Undan) ConocoPhillips, Santos, Eni, Inpex, TEPCO, Tokyo Gas	2006	1	3.5	1	188,000
	Australia Pacific LNG	ConocoPhillips, Origin Energy, Sinopec	2016	2	7.5	2	320,000
	Gladstone LNG	Santos, Petronas, Total, Kogas	2015	2	7.8	2	280,000
	Gorgon LNG	Chevron, Shell, ExxonMobil	2016	3	15. 6	2	360,000
	Pluto LNG	Woodside, Tokyo Gas, Kansei	2012	1	4.8	2	240,000
	QCLNG	Shell, CNOOC	2014	2	8.0	2	280,000
BRUNEI	Lumut	Brunei/Shell/Mitsubishi/Total	1972-74	5	7.2	3	176,000
EGYPT	Damietta	Union Fenosa, EGPC, EGAS	2004	1	5.0	2	300,000
	Idku	EGPC, EGAS, Shell, Engie, Petronas	2005	2	7.2	2	280,000
EQ.GUINEA	Bioko Island	Marathon, Sonagas, Mitsui, Marubeni	2007	1	3.4	2	272,000
INDONESIA	Bontang I	Pertamina, VICO, JILCO, Total	1977	2	5.2	5	635,000
	Bontang II		1983	2	5.2		
	Bontang III		1989	1	2.8		
	Bontang IV		1993	1	2.8		
	Bontang V		1997	1	2.8		
	Bontang VI		1999	1	3.0		
	Sulawesi LNG	Medco Energi, Pertamina, Mitsubishi	2015	1	2.0	1	170,000
	Tangguh	BP, MI Berau, CNOOC, Nippon, LNG Japan	2008	2	7.6	2	340,000
LIBYA	Marsa el Brega	Sirte Oil (NOC/Shell upgrading)	1970	2	(2.5)	2	96,000
MALAYSIA	Bintulu (MLNG Satu)	Petronas, Sarawak, Mitsubishi	1983	3	8.1	4	260,000
	Bintulu (MLNG Dua)	Petronas, Shell, Sarawak, Mitsubishi	1995	3	7.8	1	65,000
	Bintulu (MLNG Tiga)	Petronas, Shell, Sarawak, Mitsubishi, Nippon Oil	2003	2	6.8	1	120,000
NIGERIA	Bonny Island	NNPC, Shell, Total, Eni	1999	2	6.4	2	168,400
		Nigeria LNG (formed by above)	2002	1	3.2	1	84,200
		Nigeria LNG	2006	2	8.2		
		Nigeria LNG	2008	1	4.1	1	84,200
NORWAY	Snøhvit/Melkoya Island	Statoil, Total, GDF-Suez, Petoro	2007	1	4.2	2	280,000
OMAN	Oman LNG	Oman Govt., Shell, Total, Korea LNG Mitsubishi, Mitsui, Partex and Itochu	2000	2	7.1	2	240,000
		Oman Govt.,Oman LNG Union Fenosa, Osaka Gas, & Itochu	2006	1	3.7	2	240,000
PAPUA NEW GUINEA	PNG LNG	ExxonMobil, Oil Search, Santos, JX Nippon Oil	2014	2	6.9	2	320,000
PERU	Peru LNG	Hunt Oil, Shell, Marubeni, SK Group	2010	1	4.4	2	260,000
QATAR	Qatargas 1-T1&2	QP, ExxonMobil, Total, Marubeni, Mitsui	1997	2	6.4	4	340,000
	Qatargas 1-T3	QP, ExxonMobil, Total, Marubeni, Mitsui	1999	1	3.1		
	Qatargas II-T1	QP, ExxonMobil	2009	1	7.8		
	Qatargas II-T2	QP, ExxonMobil, Total	2009	1	7.8	8	1,160,000
	Qatargas III-T1	QP, ConocoPhillips, Mitsui	2010	1	7.8		
	Qatargas IV-TI	QP, Shell	2010	1	7.8		
	RasGas I- T1&2	QP, ExxonMobil, Kogas, Itochu, LNG Japan	1999	2	6.6		
	RasGas II- T3	QP, ExxonMobil	2004	1	4.7		
	RasGas II- T4	QP, ExxonMobil	2005	1	4.7	6	840,000
	RasGas II- T5	QP, ExxonMobil	2007	1	4.7		
	Rasgas III – T6	QP, ExxonMobil	2009	1	7.8		
	Rasgas III – T7	QP, ExxonMobil	2010	1	7.8		
RUSSIA	Sakhalin Island	(Sakhalin Energy) Gazprom, Shell, Mitsui, Mitsubishi	2009	2	9.6	2	200,000
TRINIDAD & TOBAGO	Point Fortin Train 1	BP, Shell, Suez, NGC	1999	1	3.0	2	204,000
	Train 2	BP, Shell	2002	1	3.3	1	160,000
	Train 3	BP, Shell	2003	1	3.3	1	160,000
	Train 4	BP, Shell, NGC	2005	1	5.2	1	160,000
USA	Cheniere Sabine Pass	Cheniere Energy	2016	1	4.5	5	800,000
	Kenai - Alaska	ConocoPhilips, Marathon Oil	1969	2	1.3	3	108,000
YEMEN	Bal-Haf	Yemen LNG, Total, Yemen Gas, Hunt Oil, SK Group, Hyundai	2009	2	6.7	2	320,000

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