LNG Unlimited

LNG JOURNAL PUBLICATION 5 April 2016

# Papua New Guinea LNG project developer sees gas momentum

**CEO Michael Hession said excellent reservoir quality tests carried out in first quarter**

**Our Asia-Pacific editor**

**InterOil's latest onshore feed-gas well tests for PNG plant**

InterOil Corp., the Papua New Guinea liquefied natural gas plant developer and stakeholder, said momentum was building for the Oceania nation's second project, Papua LNG, after excellent reservoir quality tests in the onshore Antelope natural gas field.

InterOil Chief Executive Michael Hession said the reservoir qualities identified by a short flow test late last year at Antelope-5 were successfully confirmed by a longer flow-test in the first quarter of 2016.

## Operator

The Papua LNG project will be operated by InterOil's French partner Total. They have joint venture exploration licences covering 16,000 square kilometres in PNG and their huge Elk-Antelope play is one of Asia's largest undeveloped gas fields.

"Analysis from independent sources suggests Papua LNG will be one of the most competitive new-build LNG projects globally, with short shipping distances to Asian markets and potential for attractive returns," Hession said.

"The data from the last three appraisal wells have surprised on the upside and extended flow tests have confirmed connectivity, deliverability and excellent reservoir quality across Antelope. This will mean a less complex and lower cost development," said Hession.

"While the analysis of the Antelope-6 well and the Antelope-5 flow test is continuing, results to date have been encouraging and we remain confident of a two-Train LNG development," the CEO stated.

"On completion of the appraisal program, data will be submitted to two independent auditors for certification, a process which could take four to six months," he said.

The project is on course to produce the lowest-priced LNG in the world at under $7.60 per million British thermal units.

"Following last year's restructuring and streamlining of the business, we have reduced guidance on our expected 2016 spend to a lower range of $155 million to $170 million, predominantly focused on Papua LNG," said the CEO of InterOil, listed on the New York Stock Exchange.

"While we had $252 million in current liquidity at the end of 2015, we are in discussions with our lenders to increase and extend our credit facility. It is proposed to complete the increased and extended facility in the second quarter of 2016," the CEO said.

"Our focus in 2016 will be on completing the appraisal program, progressing the certification of Elk-Antelope volumes, advancing the world-class Papua project from Basis of Design to FEED and monetizing our independently assessed discoveries with strategic partners," stated Hession.

The Papua venture has already agreed key sites, with the liquefaction plant to be located at Caution Bay, near the capital Port Moresby.

The project's central processing facility will be near the Purari River in Gulf Province, about 360 kilometres north-west of Port Moresby, and will be connected to the LNG facility by onshore pipelines and offshore pipelines to cross a bay to the capital.

A third partner in the venture in the upstream is Australia's Oil Search Ltd., also a shareholder in the existing LNG plant in PNG operated by ExxonMobil since April 2014.

■

> **"Analysis from independent sources suggests Papua LNG will be one of the most competitive new-build LNG projects globally..."**
>
> *Michael Hession, InterOil Corp. Chief Executive*

## UNLIMITED AGENDA



# International Group of LNG Importers sees growth and supply and demand evolution

**Our Europe editor**

Liquefied natural gas use continues to grow at a steady pace, with importing nations now numbering 34 compared with 15 in 2005, supported by the development of Floating Storage and Regasification Units whose global capacity is now equivalent to all of Qatar's annual production of 77 million tonnes per annum.

This figure and others of interest to the industry are contained in the 2016 report of the International Group of Liquefied Natural Gas Importers (GIIGNL), based in Neuilly-sur-Seine, France.

**Jordan's floating LNG import facility in port of Aqaba**

## Onshore

Three onshore terminals, one in Indonesia and two in Japan and four offshore terminals (two in Egypt, one in Jordan, one in Pakistan) started operating in 2015, representing a combined 23.5 MTPA of additional import capacity.

The three new markets that imported LNG through offshore terminals were at Ain Sokhna in Egypt, in Aqaba, Jordan and Port Qasim in Pakistan. In addition, in December 2015, Poland brought a commissioning cargo to its onshore terminal in Swinouscjie on the Baltic coast.

"At the same time pricing levels and structures are evolving as well," said GIIGNL President Domenico Dispenza.

"Regionalized until recently, LNG prices have declined globally in recent months because of common drivers, such as the drop in oil prices, slow demand and the ample supply situation," Dispenza explained.

"Price convergence in the Atlantic and Pacific Basins has reduced arbitrage opportunities and curbed the enthusiasm for inter-basin trade.

"As a consequence, re-loadings dropped from 6.4 MTPA in 2014 to 4.4 MTPA last year.

"The decline in spot and short-term volumes imported by Japan and South Korea was partly offset by deliveries to Egypt, Jordan and Pakistan," Dispenza noted in his introduction to the report.

"As a result, the share of spot and short-term LNG transactions remained stable compared to last year, around 28 percent of total trade.

"Based on data submitted by GIIGNL members who cover about 80 percent of worldwide LNG flows, the share of 'true' spot trades - defined as trades of LNG cargoes delivered within 90 days from the date at which the transactions is concluded - was estimated at approximately 15 percent of all trades last year," he said.

The report noted that in the near to medium term, the consequences of low prices on LNG trade seem difficult to predict, which brings considerable uncertainty along the value chain for the next five or so years.

"As a result, greenfield investment decisions expected in Africa and Canada have been deferred and only five final investment decisions have been taken in 2015 - four of which were in the USA and one in Cameroon - for a total capacity of 19.3 MTPA.

"On the demand side, buyers are striving to reshape their strategies in order to mitigate risks, to optimize procurement costs and maximize flexibility," Dispenza said. ■

# Shell executives to analyse mega-projects and evolving market dynamics at LNG 18

Royal Dutch Shell says the landscape is changing for the development and delivery of liquefied natural gas mega-projects around the world from Oman in the Middle East to Sakhalin Island in the Russian Far East.

"As we look into the future, it will remain challenging," said Hilary Mercer, Vice-President of Integrated Gas Projects at Shell Global Solutions in Malaysia.

"The stakeholders involved are more varied with different needs and aspirations, the partnerships created to deliver the opportunity are more disparate, new geographic locations are being explored, the impact of non-technical risks on project delivery continues to rise and more technology advances are available to deploy," she explained. "But has the recipe for developing LNG mega-projects become too complex, are they still affordable?" she asks.

Mercer is one of the speakers at the LNG 18 conference and exhibition scheduled to take place from April 11-15, 2016, in the Western Australia city of Perth.

The Shell executive plans to examine questions such as the right amount of technology to deploy for LNG ventures and whether the industry is creating the best environment to develop the next generation of LNG professions.

Mercer's presentation is scheduled for April 13 at the LNG 18 event. She will draw on personal experience gained whilst delivering LNG projects and Shell says its executives will provide insight into how LNG mega-projects are developed and how technical and non-technical risks are managed.

Mercer's Chief Executive Ben van Beurden will be one of the speakers on the opening day plenary session, along with his counterparts from Chevron and Woodside of Australia, John Watson and Peter Coleman respectively.

LNG industry professionals from more than 70 countries and hundreds of additional gas industry people will attend the LNG 18 conference, the industry's most prestigious event, held every three years.

Stefan Vos de Wael, General Manager, Portfolio & Strategy for Shell Eastern Petroleum, will also address the conference on "The evolving LNG market - the supply and demand dynamics."

"It has evolved from being a fuel used to meet the electricity demand of a limited number of countries to a truly global commodity," Vos de Wael said.

Vos de Wael asks whether there is enough demand to meet such rapidly rising supply because of new projects coming on stream.

"Emphatically, the answer is 'yes', but it won't happen by accident and the industry needs to determine this course, rather than cross its fingers and hope," he said.

This presents opportunities and challenges, for countries with newly discovered gas resources.

See Website www.lng18.org ■

# Engie Global Markets is new name in LNG trade

Engie of France, one of Europe's leading importers of liquefied natural gas that most recently shipped an annual 16.4 million tonnes of cargoes, has renamed its trading arm Engie Global Markets for LNG and other markets.

Engie, the former French utility GDF-Suez, had previously traded in energy and power markets under the name GDF-Suez Trading.

The trading subsidiary serves all Engie's business activities worldwide, including upstream and downstream energy markets.

"With a 390-staff, Engie Global Markets has an extended geographical coverage in Europe and the Asia-Pacific region, with four trading floors in Paris, Brussels, Rome and Singapore, and activities spread across 40 countries," Engie explained.

"Under this new brand, we are reaffirming our ambition to further extend our client-base, product range and business activities at an international level," said Philippe Vedrenne, recently appointed Chief Executive of Engie Global Markets.

As far as its LNG market activities are concerned, Engie controls a fleet of 14 LNG carriers under mid-term and long-term charter agreements. The fleet is permanently optimized to satisfy Engie trading opportunities.

The group has also a significant presence in regasification terminals in France and overseas, which gives a permanent access to markets.

Engie will also be a trader in US LNG by 2020 from agreement with Houston-based export plant developers Cheniere and its own stake in Sempra's Cameron LNG venture in Louisiana. ■

# Qatar-led LNG export project in Texas is given conditional FERC approval

**Our North America editor in New York**

US regulators have given conditional clearance to the Golden Pass LNG export project in Texas being developed by Middle East producer Qatar Petroleum, with ExxonMobil Corp and ConocoPhillips as partners.

The Federal Energy Regulatory Commission released its environmental impact statement for the existing import facility on the Sabine-Neches Waterway in Texas to be transformed into a liquefaction plant.

## Capacity

Golden Pass LNG will have the capacity to export up to 15.6 million tonnes per annum of LNG, the equivalent of 740 billion standard cubic feet of natural gas.

The application to the FERC included 2.6 miles of interconnected pipeline located in Calcasieu Parish in Louisiana and other facilities in two Texas counties.

The FERC concluded that approval of the proposed project "would result in some adverse environmental impact, though impacts would not be significant with implementation of proposed mitigation by Golden Pass LNG" and additional measures recommended in the draft EIS by the regulator's staff.

**Golden Pass is located on the Sabine-Neches Waterway**

Qatar Petroleum holds 70 percent of the venture and its partners ExxonMobil and ConocoPhillips share the remaining 30 percent stake.

The three companies have said they expected to invest around $10 billion to transform Golden Pass into a liquefaction plant.

Qatar's partnership with ExxonMobil helped make the Gulf state into the world's leading LNG exporter with 77 MTPA of capacity.

The US major has stakes in eight LNG Trains in Qatar owned by the two operating companies, Qatargas and RasGas, while Conoco-Philips has a share in one Qatargas Train.

The Golden Pass facility is not far from Cheniere Energy's Sabine Pass liquefaction that came on stream in February 2016 and has begun exporting cargoes.

US LNG engineer Chicago Bridge and Iron and Japan's Chiyoda Corp. were awarded a front-end engineering and design services contract for the Golden Pass facility in 2014. ■

# Panama Canal to be ready for LNG carrier traffic after June 26 opening

The expanded section of the Panama Canal is expected to be officially opened on June 26, 2016, when it will be able to accommodate larger vessels such as liquefied natural gas carriers transiting and returning on the Atlantic-Pacific route.

The expansion work includes two new lock complexes with a total of 16 gates, eight on the Pacific side and eight on the Atlantic side.

A new transit tariffs system for the Canal will also come into force from the end of June, four months later than was originally planned in the most recent re-scheduling of the project built at a cost of more than $5.5 billion.

The use of the expanded Canal by LNG carriers, rather than the longer voyage around the tip of South America, will cut cargo carriage to Asia from the US Gulf coast by more than 7,500 nautical miles.

Panama had held a national referendum in 2006 and voted "yes" to expand the Canal to accommodate the larger ships.

The plan included new locks with greater capacity and expanding the Canal itself to make it deeper and wider at specific choke points.

Under the new Canal tariff system, LNG carriers of around the optimum 172,000 cubic metres capacity for using the Canal will pay a total of $680,480 for round-trip transits.

The tariff would cover the delivery of a cargo, for example, from the US Gulf Coast or the Atlantic Basin to the Far East and returning with ballast. The Panama Canal Authority (ACP) said it was currently training more than 1,000 staff on the operations of the new locks that are the key parts of the waterway's expansion.

"Once the first training phase is completed, the courses will be standardized and offered to additional members of the workforce," the authority said.

Canal personnel participating in this training include future operators and lockmasters of the Agua Clara (Atlantic) and Cocoli (Pacific) Locks, as well as engineers and information technology personnel.

"The Canal's workers are critical to the ACP's ability to provide reliable, efficient, and safe service. ■

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# NEWS NUDGES

### Sempra sells REX stake

Sempra Energy, the owner of LNG terminals in the US state of Louisiana and northern Mexico, has agreed to sell its 25 percent interest in the Rockies Express Pipeline (REX) for around $440 million in cash to Tallgrass Development of the US. “While REX is an important part of the country's natural gas pipeline system, we believe that given the changing market conditions, we can more productively redeploy the proceeds from the REX sale into long-term growth opportunities,” said Sempra.

### Engie LNG trucking fuel

Engie, the French utility and energy company, said it planned to invest almost 100 million euros ($113M) from now to 2020 to set up LNG and compressed natural gas (CNG) filling stations for trucking fleets. Engie said it was building the network in cooperation with truck manufacturers as well as the national and European authorities. “The investment will cover the building of 30 CNG stations in France and up to nearly 70 LNG stations in several European countries,” the company said.

### Nova Scotia LNG pipeline

Bear Paw Pipeline Corp., the Nova Scotia LNG export plant pipeline company owned by Australian firm LNG Ltd., has applied for a permit from the Canadian province’s environmental agency. The company is proposing to construct and operate a 62.5 kilometres natural gas pipeline from Goldboro in Nova Scotia to the planned Bear Head LNG plant at Point Tupper in Richmond County. ■

# Japanese and European banks help finance first LNG facility in Bahrain

**Our Middle East editor**

The oil investment company of the Arab Gulf nation of Bahrain has borrowed $570 million from Japanese and European banks to help finance the island’s first LNG import facility and to upgrade an oil refinery.

The investment arm of Bahrain’s National Oil and Gas Authority said it would use the money to help finance planned energy investments over the next few years that amount to more than $7 billion.

### Ten lenders

The 10 banks that participated in the latest loan included Japan’s Bank of Tokyo-Mitsubishi UFJ, France’s BNP Paribas and the UK’s HSBC.

The drop in oil prices by more than 30 percent in the past year has led to oil-producing countries in the Gulf borrowing more to meet extra expenditures.

Bahrain has awarded the contracts for its first LNG facility, with Teekay LNG chosen to provide the LNG carrier that will be deployed as a floating storage unit.


**Bahrain has project deal with Teekay LNG and Samsung**

In addition to working with a unit of Canadian shipping company Teekay, Bahrain said South Korean construction firm Samsung Construction & Trading Corp. would build the onshore infrastructure.

Samsung C&T has previous experience, having completed the onshore LNG import terminal at Manzanillo on the Pacific Coast of Mexico in 2012.

The Bahrain terminal design envisages an LNG carrier acting as storage and with output capacity of 800 million cubic feet per day.

Arab nations have favoured floating LNG solutions. Previously Kuwait began importing LNG through a port-side Floating Storage and Regasification Unit (FSRU) terminal in 2009 and Dubai's FSRU started imports to the United Arab Emirates in late 2010.

The Bahrain facility will have separate regasification equipment, according to the engineering plan.

The Kingdom of Jordan started its LNG imports at the port of Aqaba in May 2015 about a month after Egypt brought into service its first FSRU at the Red Sea port of Ein Sokhna. ■

# Canadian LNG export project awards engineering contract after approval

KBR, the US energy and liquefied natural gas engineering firm, was awarded a multi-phased contract for front-end engineering and design for the Canadian LNG export project controlled by Indonesian billionaire Sukanto Tanoto and his Pacific Oil and Gas company in the province of British Columbia.

The Woodfibre LNG project has just received environmental approval from the federal ministry in Ottawa for the liquefaction plant and export terminal planned near the town of Squamish, north of Vancouver.

Under the terms of the contract, KBR's Houston office will provide FEED services for the proposed liquefaction plant and export facility to produce 2.1 million tonnes per annum of LNG. The work will include engineering optimization and the development of a fixed-price offer for engineering, procurement and construction services.

“KBR is a world leader in LNG engineering and design,” said Byng Giraud, the Canadian manger of Woodfibre LNG.

“The award of the FEED contract to KBR ensures the Woodfibre LNG project is engineered and designed to world-class standards, and marks another important step towards making the project a reality,” Giraud added.

Roy Oelking, President of KBR's Engineering & Construction (E&C) business, said his company had a strong track record for developing projects in British Columbia.

“We are pleased to play an important role in the Woodfibre LNG project, providing the expertise and capability of our 40-year history in LNG project delivery to help make this project a success,” Oelking stated.

KBR did not disclose how much the contract was worth. “The contract is multi-phased and the first phase will be booked into backlog of unfilled orders for KBR's E&C business segment the first quarter of 2016,” KBR said.

The LNG unit of Tanoto’s company, which has corporate offices in Singapore, Beijing, Hong Kong and Jakarta, has already signed a supply contract with China’s Guangzhou Gas and owns a stake in a Chinese LNG import terminal. ■

# Largest Japanese LNG buyers help revive recently rejected US project in Oregon

**Our North America editor in New York**

The Jordan Cove LNG project in the northwest state of Oregon, recently blocked by US regulators, is set to get back on track after it signed a supply agreement with the two largest utilities in Japan.

Jordan Cove project developer, Canadian company Veresen Inc., revealed on March 11, 2016 it had received its rejection notice from the US Federal Energy Regulatory Commission 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.

## Impact

The venture is planned for the Coos Bay area of in Oregon with a budget of $6 billion. It completed its environmental impact regulatory process with the FERC on September 30, 2015.

**Venture planned for Coos Bay with a budget of $6 billion**

Veresen said it had now signed commercial terms for a 20-year supply agreement with JERA Co. Inc., a joint venture between Tokyo Electric Power and Chubu Electric.

This will give the Japanese utilities natural gas liquefaction capacity in the form of a tolling agreement at the Jordan Cove LNG facility planned for Coos Bay in Oregon.

The preliminary agreement signed today covers the purchase by JERA of at least 1.5 million tonnes per annum of LNG tolling.

"This agreement is subject to customary conditions including the execution of a detailed liquefaction tolling agreement which Veresen and JERA will continue to work together to conclude, and the project obtaining applicable regulatory approvals," Veresen added.

The Canadian company said it was continuing to negotiate additional supply agreements with other parties as well.

The JERA joint venture was established on April 30, 2015, by Tepco and Chubu as a way of bringing down costs covering the entire energy supply chain, from upstream investments and fuel procurement through to power generation.

The Tepco-Chubu combination is the biggest LNG buyer in the world, purchasing almost half of Japan's annual requirement of around 88 million tonnes.

The joint venture became possible under Japanese government reforms to liberalize the power sector in the country.

# Swedish gas transmission firm studies LNG hub plans

Swedegas, the operator of the gas transmission grid in Sweden, said it was examining the potential for a liquefied natural gas terminal and storage facility as well as a small-scale barge shipping and bunkering joint venture in a central coastal area of the country.

The Swedish gas company said it was aiming to establish more gas infrastructure in the Gävle region in the historical Northern Lands area.

The company has signed a memorandum of understanding with Kanfer Shipping of Norway for a potential venture involving the transport of LNG by sea as well as an LNG storage facility in Gävle.

Swedegas is currently in discussions with Kanfer about what form "a flexible and robust solution" for supplying the region with LNG and gas might take.

This could involve LNG being transported to a port on barges pushed by tugs. The barges would then function as floating storage facilities at the port.

"From there, the LNG, following regasification, can be transported onwards in the Swedegas network," it explained.

The LNG barges are based on the US Articulated Tug Barge (ATB), a patented vessel design also called a push barge.

"This concept is favourable from an operating cost point of view, which will benefit customers in the region," said Johan Zettergren, Swedegas Vice President.

The Swedegas investment plan will include a regional gas network and an LNG terminal. ■

# Chinese ENN Group buys big Santos stake and builds up Australian presence

**Our Asia-Pacific editor**

The Chinese ENN Group, which has signed contracts for LNG cargoes from around the world, has agreed to purchase almost 12 percent of the shares of Australia energy company Santos, a stakeholder in three Asia-Pacific liquefaction plants.

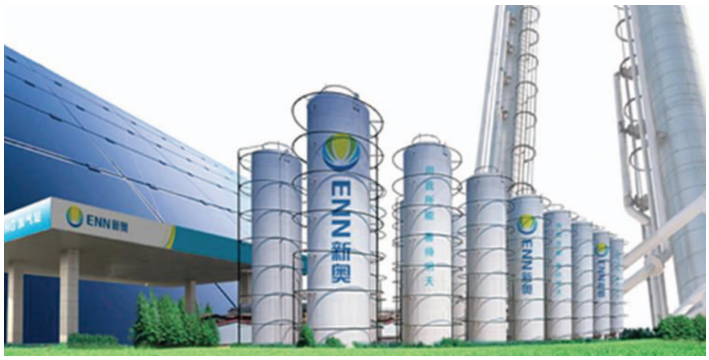
The ENN shareholding of 11.7 percent of Santos will come from a private share placement made in 2015 by Santos itself to equity fund Hony Capital of China.

## Largest shareholder

The Santos stake cost US$750 million to make ENN the largest individual shareholder in the Australian company. At the same time, Chinese equity fund Hony is taking a "strategic" stake in the ENN Group.

Santos also placed shares in 2015 with another of Asia's leading equity funds, Singapore state fund Temasek, as part of a capital-raising exercise to weather the storm of the oil price plunge.

Santos, whose Gladstone coal-seam-gas-to-LNG plant was recently completed on Curtis Island in Queensland at a cost of US$18.5 billion, is also a stakeholder in the Darwin LNG facility run by ConocoPhillips and the Papua New Guinea liquefaction plant operated by ExxonMobil.




**Move into upstream sector for Chinese LNG and gas company**

The privately-held Chinese group and its ENN LNG and energy subsidiaries own and operate natural gas supply businesses in 152 cities across 17 provinces and autonomous regions of China.

The company is also having its own LNG import terminal built at Zhoushan in China's eastern Zhejiang province.

In addition to taking the Santos stake, ENN has also signed preliminary supply agreements with two other Australian LNG plants, Chevron's Gorgon LNG and the Australia Pacific LNG facility in Queensland, operated by ConocoPhillips.

"The proposed acquisition is an exciting move for ENN," said Wang Yusuo, Chairman of the ENN Group.

"This introduction to the upstream sector takes us a step forward in our aim to generate value across the entire natural gas value chain, and allows us to learn and build experience," Wang added.

"Equally importantly, we are gaining a strategic investor and partner in Hony Capital whose deep China experience and global outlook can help us accelerate future growth overseas," he stated. ■

# Australian Browse floating LNG joint venture cancelled because of downturn

Australian liquefied natural gas operator Woodside has cancelled the planned Browse floating LNG joint venture offshore Western Australia because of the current economic and market environment.

Woodside said in January 2016 it was studying costs in relation to the Browse FLNG venture it was developing with Royal Dutch Shell, BP of the UK, PetroChina and Japan's Mitsui and Mitsubishi.

The Australian company had at the time "progressed well" on delivering targeted cost savings and improving project value during the front-end engineering and design.

Work continued on a range of activities related to the commercialization, timing and sequencing of the Browse FLNG development before a final investment decision - now taken.

The Browse FLNG project proposed developing the Brecknock, Calliance and Torosa gas fields in the Browse Basin, which are estimated to contain around 15.4 trillion cubic feet of dry gas, and producing LNG offshore using Royal Dutch Shell FLNG technology.

The Browse Basin is located about 425 kilometres north of the town of Broome in Western Australia.

Woodside Chief Executive Peter Coleman acknowledged the high quality of technical and non-technical work completed on the Browse FEED programme to enable the Browse joint venture participants to reach this decision.

"We have undertaken a comprehensive and rigorous process to assess all elements of the development.

"The decision represents a disciplined approach to large-scale capital investment and is consistent with our requirements for a development concept to be commercially robust across a range of scenarios.

"Woodside remains committed to the earliest commercial development of the world-class Browse resources and to FLNG as the preferred solution, but the economic environment is not supportive of a major LNG investment at this time," Coleman stated. ■

# Tokyo Gas starts commercial operations at 33rd Japanese regas and import facility

**Our Asia-Pacific editor**

Tokyo Gas Co., Japan's third-largest LNG importer, has started full commercial operations at the nation's latest import terminal at Hitachi port in a network now numbering 33 regasification and satellite facilities.

Togas said it had started full operations at the Hitachi regasification terminal in the main port area of Ibaraki prefecture northwest of Tokyo on the Pacific coast.

**Terminal now operating in Ibaraki region northwest of Tokyo**

## Outside bay area

The terminal is the first constructed by Togas located outside of Tokyo Bay and has storage capacity of 230,000 cubic metres of LNG in a single tank.

The Hitachi terminal has already received three cargoes since January 2016, one from Malaysia's Bintulu plant and two from Russia's only LNG export plant at Sakhalin in the Far East.In addition to building the Hitachi facility, the Japanese utility has also been upgrading its three LNG import terminals on Tokyo Bay, Negishi, Ohgishima and Sodegaura.

The new Hitachi terminal has also incorporated the add-ons adopted by the newest European import terminal such has re-loading facilities for domestic LNG carriers as well as a six-lane truck-loading area for small-scale fuel distribution.

In conjunction with the start of operations at the Hitachi LNG terminal, Togas also began delivering natural gas via the newly constructed Ibaraki-Tochigi pipeline of 80 kilometres in length.

The Ibaraki-Tochigi interconnect is a high-pressure trunk line that runs from Hitachi city in Ibaraki prefecture to the city of Moka in Tochigi prefecture.

"The company began construction of the Hitachi LNG terminal and the Ibaraki-Tochigi Line in 2012 in order to meet the future growth of gas demand towards 2020," Togas said.

The Japanese utility is also building a second LNG storage tank and will bring it into operation by 2020.

"The company will also improve the energy security in the Kanto region by looping high-pressure trunk lines through the connecting and existing Kashima Waterfront Line and Ibaraki Line," it added.

The last import terminal completed in Japan was the Hachinohe facility completed in 2015 for JX Nippon Oil, a shareholder in the Papua New Guinea LNG production plant and was the 32nd terminal in the Japanese network.

Another facility, the Kushiro LNG terminal in Hokkaido, serves as a satellite receiving terminal for LNG coastal tankers from Hachinohe. ■

# Fluxys Belgium gives upbeat report on LNG and Yamal Trade services as well as Europe

Fluxys Belgium, the operator of the Zeebrugge LNG terminal and the Belgian natural gas transmission network, posted annual revenue slightly down as it continued to invest in LNG and natural gas infrastructure.

Fluxys said operating revenue for 2015 in its regulated business amounted to 538 million euros ($609M) compared with 555M euros in the previous year, a fall of 3.1 percent.

The company posted an annual net profit of just 61.1 million euros ($69M) as it invested 188 million euros, including in the upgrading of LNG facilities.

The Belgian operator is constructing a second jetty for loading and unloading LNG carriers.

The second jetty, where the smallest LNG ships will be able to berth, will be commissioned later in 2016.

Fluxys said it was also progressing with the building of a fifth LNG storage tank and associated installations as part of its 20-year agreement to welcome ships from the Russian Yamal LNG plant currently being built in the Arctic region of Russia to trans-ship cargoes during the winter season.

"This is to guarantee sufficient storage capacity between unloading and loading operations for trans-shipment services from an icebreaker LNG ship to a conventional LNG ship under the contract with Yamal Trade," Fluxys explained in its earnings report.

Fluxys said its versatile LNG terminal services now on offer at Zeebrugge port were proving successful.

"With 41 ship unloading operations, 28 ship loading operations and 1,184 truck loadings in 2015, the Zeebrugge LNG terminal saw a high level of capacity utilisation compared with other terminals in Northwest Europe," Fluxys said. "A market test showed there was interest in additional possibilities for loading small LNG ships. Accordingly, Fluxys LNG launched a preliminary study on the infrastructure expansions that would be needed," it added.

In March 2015, Fluxys LNG concluded a 20-year contract with Yamal Trade for the trans-shipment of up to 8 million tonnes of LNG per year.

"The trans-shipment services will form a key link in the logistics chain from Russia's Yamal peninsula to supply countries in Asia and the Pacific Ocean year-round," it said.

Fluxys also reported a rise in volumes transported by pipeline, though saw a decline in booked capacity.

"Customers increasingly book capacity on a short-term and align their capacity portfolios as closely as possible with the capacity they will actually use.

"In this context and despite the rise in transported volumes, Fluxys Belgium achieved 8 percent less bookings for transmission capacity in 2015 than in 2014.

"On the other hand, transported volumes were up: compared to 2014, 9.6 percent more natural gas was transported for the Belgian market and 1.1 percent more for border-to-border transmission to neighbouring grids," it added.

Fluxys also explained that since 1 November 2015, customers were able for the first time to bring natural gas from France to Belgium: via the newly laid Flanders Artery and Alveringem-Maldegem pipelines in France and in Belgium and via the new Hondschoote/Alveringem interconnection point. ■

# Beijing accord may lead to more LNG projects for Total and China after Russian Yamal plant

**Our Asia-Pacific Editor**

Total Chairman and Chief Executive Patrick Pouyanne has signed an agreement in Beijing with China National Petroleum Co. (CNPC) to extend their cooperation on energy and LNG projects, beyond those currently underway including the Yamal LNG project in Russia.

Pouyanne signed the French energy company's latest pact with his counterpart at CNPC, Wang Yilin.


**CNPC and Total are involved along LNG value chain**

## Strategy

"This strategic cooperation agreement reflects our respective commitment to strengthening our partnership and jointly developing new projects," said Pouyanne at the signing ceremony.

"The agreement further strengthens the existing partnership to support the international strategy of CNPC's affiliate PetroChina," said the Total CEO.

In the past 10 years, Total and CNPC have formed a number of partnerships involving major projects, including the Sulige natural gas field in Inner Mongolia, China, and Yamal LNG in Russia.

Total is a shareholder in the Russian energy company Novatek, which owns 50.1 percent of Yamal LNG.

The French company and CNPC each hold 20 percent of the project, while Chinese funding is underpinning the construction of the liquefaction plant and export terminal.

The current CNPC-Total LNG collaboration is on one of the world's most challenging LNG projects.

The venture is located in the Yamal Peninsula deep in the Russian Arctic, a region that is ice-bound for seven to nine months of the year.

More than 200 wells will be drilled for the project involving three liquefaction Trains, each with a capacity to produce 5.5 million tonnes per annum of LNG.

To ensure its stability, the plant will be supported by tens of thousands of piles driven some 20 metres into the permafrost.

For the transport of equipment and construction teams, the port of Sabetta and an airport had to be built from scratch.

Over the next couple of years until the end of 2017, the port of Sabetta is taking delivery of 150 modules representing 450,000 metric tonnes of equipment.

Also specially designed to operate when Yamal is completed are 15 LNG ice-breaker carriers, each of which has a capacity of 170,000 cubic metres.