LNG Unlimited

LNG JOURNAL PUBLICATION 5 June 2018

Petronas finally opts for stake in Shell-led LNG Canada joint venture

Malaysians 'look forward to adding value to this venture across the value chain'

LNG Journal editor

Petronas CEO Wan Zulkiflee Wan Ariffin outlines aims

Petronas of Malaysia has taken a stake in the Royal Dutch Shell-led LNG Canada project in British Columbia after cancelling its own venture in BC called Pacific Northwest LNG.

Petronas signed an agreement for an equity position in LNG Canada to be constructed at a brownfield site near the town of Kitimat.

Committed

"As one of the world's largest LNG producers, Petronas looks forward to adding value to this venture through our long-term expertise and experience across the LNG value chain," said Petronas President and Chief Executive Wan Zulkiflee Wan Ariffin.

"We are committed to deliver LNG and natural gas, the cleanest fossil fuel in the world, to the growing global energy market," he added.

When the Petronas transaction is complete, the Malaysian company will hold 25 percent of the shares, Shell will have 40 percent, PetroChina 15 percent, Japan's Mitsubishi 15 percent and Korea Gas Corp. 5 percent.

"Petronas is in Canada for the long-term and we are exploring a number of business opportunities that will allow us to increase our production and accelerate the monetization of our world-class resources in the North Montney," said CEO Wan Ariffin.

"LNG is just one of those opportunities," he added.

Energy project construction companies JGC Corp. of Japan and Fluor Corp. of the US were awarded an engineering, procurement and construction order in April 2018 to design and build the LNG Canada plant.

The BC government has offered incentives amounting to US$4.8 billion in provincial income, sales and carbon tax cuts to build the facility.

However, LNG Canada has yet to give a specific date for a go-ahead on the project.

Shell's project is backed by the Haisla First Nation native North Americans whose traditional lands surround the Kitimat area.

Shell said that while pushing back its final investment decision for the first time in 2016 it still viewed LNG Canada as a promising opportunity at some time in the future.

Analysts said that one of the things that must change in Canada is the regulatory complexity that adds to soaring costs.

The liquefaction plant, infrastructure and feed-gas pipelines from northeast BC to the coast are likely to cost more than $US30 billion.

The liquefaction plant at Kitimat is expected to cost up to US$14Bln using modular construction methods.

Feed-gas

Additional costs will include feed-gas supplies and an investment in the multibillion-dollar TransCanada pipeline project, the Coastal GasLink.

LNG Canada already holds a 40-year export licence from the National Energy Board for exports of domestic gas overseas, though further final permits are required, including one from the federal government.

While BC province itself formerly had 20 LNG export ventures on the table, there are now only two others moving forward, the small-scale Woodfibre LNG venture at Squamish in BC and the Steelhead LNG venture on Vancouver Island.

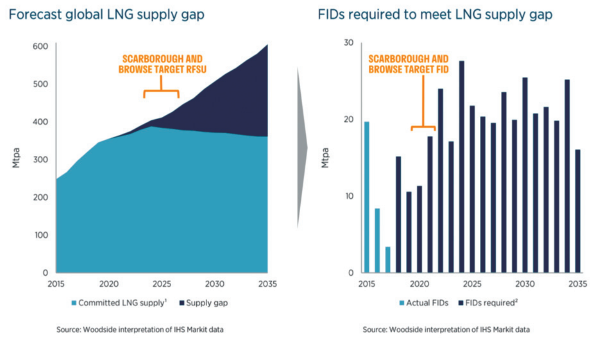
■

UNLIMITED AGENDA

Australian LNG operator Woodside forecasts Asian demand surge for additional supplies

LNG Journal editor

Tightening LNG market



Woodside vision of market dynamics and spending plans

Woodside Petroleum is executing its growth plans, including a second processing Train at the Pluto LNG plant in Western Australia as the company said there would be growing sales opportunities in the Asian market of up to 175 million tonnes per annum through the 2020s.

"As significant growth in demand continued in Asia's emerging markets and a large portion of long-term supply contracts are due to expire in the 2020s," said Woodside in a briefing for analysts.

Approval

The planned new liquefaction Train would take output at Pluto to around 9 MTPA and there is environmental approval for 12 MTPA of output at the facility.

Woodside operates the Pluto plant as well as the North West Shelf LNG plant at Karratha and is also a shareholder in the Wheatstone LNG plant in the Pilbara region that came on stream in 2017.

The expansion plans also involve optimizing North West Shelf plant output with additional feedgas from the offshore Browse Basin that was previously the subject of plans for a stand-alone LNG export project.

The company also noted that the Wheatstone plant was performing well as its operations were ramped up and the plant neared completion after coming on stream in 2017. The two-Train facility has a nameplate capacity of 8.9 MTPA. "Wheatstone LNG Train 1 is exceeding nameplate capacity and Train 2 is coming on stream in June," said Woodside.

"Our strategy is underpinned by our ongoing strong base business, world-class asset performance and execution of committed projects," said Chief Executive Peter Coleman.

"Existing business and committed growth is targeted to lift annual production to approximately 100 million barrels of oil equivalent in 2020," added Coleman.

"We have outlined a roadmap for growth across three five-year time horizons. The actions we have taken since then to increase our interest in Scarborough and raise equity further support our ability to deliver on that plan," said the CEO.

"Market conditions are also supporting our strategy, LNG demand growth has been higher than most forecasters expected, development costs are at a low point in the cycle and there has been a lack of investment in new production," explained Coleman.

"We are working to unlock maximum value from our existing infrastructure by processing gas from Scarborough through a low-cost expansion of Pluto LNG and Browse through the North West Shelf facilities," he added.

"The progress we are making will enable us to develop these projects in time for the expected global LNG supply shortfall in the early 2020s," stated Coleman. ■

ExxonMobil sets new target to reduce methane emissions and flaring along gas value chain

ExxonMobil Corp., the leading US oil major and one of the world's largest LNG plant stakeholders in Qatar and in countries such as Australia and Papua New Guinea, said it had set a two-year target to reduce natural gas flaring by 25 percent and methane emissions by 15 percent to improve its overall business operations.

The Irving, Texas-based major plans to improve energy efficiency at its global refining, chemical manufacturing, LNG production and pipeline facilities.

ExxonMobil said the latest reduction plan would build on an estimated $9 billion spent since 2000 to lower atmospheric emissions, which have included investments in cogeneration, flare reduction, energy efficiency, biofuels, carbon capture, storage and other technologies.

"We have a long-standing commitment to improve efficiency and mitigate greenhouse-gas emissions," said Chief Executive Darren W. Woods.

Woodside Petroleum, the operator of two LNG production plants in Western Australia, in April 2018 became the 10th member of a group of global oil and gas majors led by ExxonMobil to sign guiding principles committing it to further reduce methane emissions from its natural gas assets.

The initiative was launched in November 2017 by ExxonMobil and Royal Dutch Shell who put forward joint proposals to reduce greenhouse-gas emissions from natural gas production.

The energy companies have drawn up a road map to advance towards reducing methane emissions from natural gas wells, pipelines and overall consumption.

In addition to ExxonMobil, Shell and Woodside, the other signatories to the pact are BP of the UK, Italy's Eni, Russian natural gas company Gazprom, Spain's Repsol, Statoil of Norway, French major Total and German oil and gas company Wintershall.

The signatories have said that implementing all of the cost-effective methane abatement measures worldwide would have the same effect on long-term climate change as closing all existing coal-fired power plants in China.

Analysts say that companies such as ExxonMobil, Shell and BP are also becoming more engaged with issues related to climate change after increasing pressure from investors and threats of future legal challenges.

Previous industry efforts have often had a broad scope that included ways to cut carbon emissions.

A recent International Energy Agency study found that an estimated 76 million tonnes of methane are emitted every year from global oil and gas operations.

ExxonMobil pointed out that it was also a charter member of the Global Gas Flaring Reduction Public-Private Partnership, which is committed to developing commercial opportunities to reduce gas flaring.

That partnership is comprised of oil-producing countries, international and state-owned oil companies and the World Bank. ■

Flex LNG CEO Cook departs amid latest loss

Flex LNG, the Oslo-listed shipping and projects company backed by funds controlled by Norwegian shipping magnate John Fredriksen, reported a widened first-quarter loss and the departure of Chief Executive Jonathan Cook.

Flex said that Cook had decided on May 28 "to resign his position to pursue other interests".

The company said it had appointed board member Marius Hermansen as an interim CEO and would pursue a recruitment process to find a replacement for Cook.

Flex added that it had also hired Marius Foss as Head of Commercial from a similar role at Golar LNG.

"Following the changes in management on 28 May and the recruitment of Mr Foss, the board has increased its focus on building a strong team around the company's modern LNGC fleet, and given the market outlook, transportation of LNG will be the company's core focus going forward," it stated.

Flex also revealed that on May 28 it signed an agreement to acquire two 174,000 cubic metres capacity LNG carriers under construction at Hyundai Heavy Industries in South Korea. The company said it paid "an attractive price" of $184M for each vessel.

Flex added in its earnings statement that first-quarter revenues had amounted to $15.1M as it recorded a net loss of $1.8M compared with a $1.0M loss in the same three months of 2017.

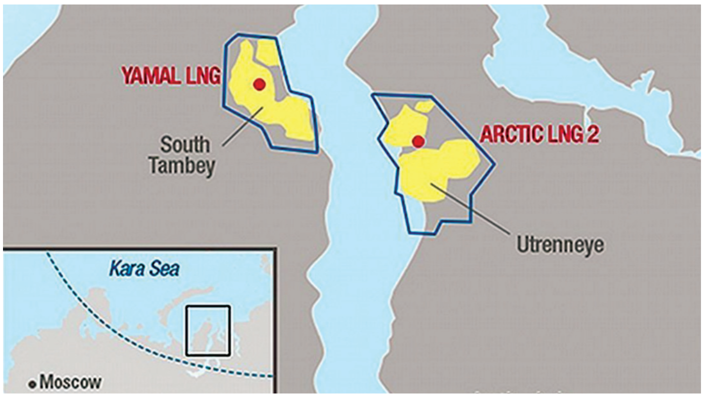
Fredriksen's Geveran Trading trust company has a substantial stake in Flex.

Total CEO says second Russian plant will point 20 MTPA at Asia

LNG Journal editor

French energy company Total, an almost 20 percent stakeholder in Russian natural gas company Novatek, has as expected taken a share in its proposed Arctic LNG 2 project aimed at matching the Yamal liquefaction plant that came on stream in Siberia at the end of 2017.

The latest Total-Novatek agreement was signed in the city of St. Petersburg in the presence of Russian President Vladimir Putin and visiting French President Emmanuel Macron.



Facilities are planned for the Gydan Peninsula in Siberia

Terms

Arctic LNG 2 is planned for the Gydan Peninsula in the north of Siberia near the Yamal Peninsula where Novatek constructed the Yamal joint venture, whose partners also include Total as well as China National Petroleum Corp and Chinese equity firm, the Silk Road fund.

Total said it signed an agreement with Novatek outlining the terms for it to acquire 10 percent of Arctic LNG 2, which because of its shareholding in Novatek itself would actually amount to a 21.5 percent economic interest in the venture.

The French company first took a stake in Novatek in 2011 when it agreed to purchase 12 percent of the Russian company and to raise its holdings to 19.4 percent over a period of three years under a co-operation accord between Novatek Chairman Leonid Mikhelson and the late Total Chief Executive Christophe de Margerie.

"Total is delighted to be part of this new world-class LNG project alongside its partner Novatek, leveraging the positive experience acquired in the successful Yamal LNG project," said Total Chairman and Chief Executive Patrick Pouyanne.

"This project fits into our strategic partnership with Novatek and also with our sustained commitment to contribute to developing the vast gas resources in Russia's far north which will primarily be destined for the strongly growing Asian market," added Pouyanne.

Total said that with a proposed production capacity of almost 20 million tonnes per annum, the Gydan Peninsula project would unlock more than 7 billion barrels of oil equivalent of hydrocarbons resources in the onshore Utrenneye gas and condensate field.

Inpex starting LNG production at US$37Bln Ichthys export project

Inpex Corp, the Japanese energy company, said its Ichthys LNG export project in Australia's Northern Territory completed the commissioning of the offshore Central Processing Facility, opening the way for the start of production at the US$37 billion joint venture, now more than 18 months behind scheduled.

Inpex said that with the CPF, the "Ichthys Explorer", operating over the Ichthys gas field offshore northwest Australia production can now start.

The company said the project is scheduled to commence production of gas from the wellhead upon conducting final safety verifications, and will proceed with the shipment of cargoes by September 2018.

Inpex, whose main partner in the venture is French energy company Total, said the project had already completed drilling the production wells required for the start-up and the 890 kilometres-long gas pipeline is ready to operate.

The pipeline will take the feedgas to the liquefaction plant constructed at Bladin Point, near Darwin.

The late arrival of the offshore platforms was one of several factors that have delayed the commercial start of the Ichthys venture for Inpex and Total.

The plant will produce 8.9 million tonnes per annum from two processing Trains and cargoes will be shipped to Japan's main utilities and to Taiwan. A total of 8.4 MTPA of output has been pre-sold.

Inpex is also a shareholder in the Prelude FLNG project currently being commissioned in northwest Australian waters by Royal Dutch Shell.

The Japanese company has, meanwhile, recently named Takayuki Ueda as its new Chief Executive and President from June 26 and also made changes in other senior management posts.

NEWS NUDGES

Hoegh LNG profits up

Hoegh LNG posted improved first-quarter earnings of $38.1 million compared with $36.7M in the same quarter of 2017, while net profits amounted to $13.2M versus $11.4M in the same three months of the last year. "We are pleased to deliver another quarter with strong operational results," said President and Chief Executive Sveinung J. S. Stohle. "Our eighth FSRU, 'Hoegh Esperanza', was delivered in April and is now set to start a three-year time charter," added the CEO.

GasLog deal for Centrica

GasLog, the Monaco-based LNG carrier owner and operator whose fleet will soon number 30 vessels, said it signed a seven-year charter agreement for a newbuild with UK utility and energy company Centrica, the second LNG carrier deal between the two companies. GasLog said the carrier would have capacity of 180,000 cubic metres and has been ordered from Samsung Heavy Industries in South Korea, with expected delivery in the third quarter of 2020.

Korea plans for accord

The South Korean Energy Ministry said it was finalising the wording of a memorandum of understanding reached with China and Japan on strengthening cooperation on liquefied natural gas, including support from the three nations on the eventual removal of strict destination clauses. South Korea imports most of its LNG under long-term contracts that include destination restrictions forbidding the resale of cargoes to other countries by Korean companies.

Nova Scotia LNG developer Pieridae posts quarterly loss as project advances

LNG Journal editor

Pieridae CEO Alfred Sorensen at site of Goldboro plant

Pieridae Energy, the Canadian company developing the Goldboro LNG project in the Atlantic Coast province of Nova Scotia, has posted widening losses at it advances with its plans for a Nova Scotia LNG export plant targeting European customers.

Pieridae reported a first-quarter loss of C$2.94 million (US$2.28M) compared with C$2.05M in the same three months of 2017.

Reserves

The Calgary, Alberta-based company had cash available of around C$18.92M compared with C$21.23M in the 2017 quarter.

The Goldboro facility will be located at the Goldboro Industrial Park where the company has acquired 265 acres of land from the municipality of the District of Guysborough.

Goldboro will have at least two full containment LNG storage tanks, each with a capacity of up to 230,000 cubic metres and the facility is expected to enter production by 2023 with 10 million tonnes per annum of capacity.

The Canadian company, listed on the Toronto Stock Exchange, has signed a deal with German utility and energy company Uniper for 50 percent of Goldboro's initial capacity as part of a 20-year, take-or-pay contract.

It also announced a second supply agreement in May 2018 with an unnamed customer relating to the proposed plant's second Train.

Pieridae said that accord was for the purchase up to 1 MTPA of LNG. This contract is scheduled to begin by the first quarter of 2023 and last for 10 years.

"After having contracted the entire output from Train 1 with Uniper, this agreement moves Pieridae another step closer to the final investment decision on Train 2, which would bring much-needed jobs and other economic benefits to Nova Scotia and Canada," said Alfred Sorensen, Chief Executive of Pieridae in a May statement.

Pieridae has engaged US investment bank Morgan Stanley & Co and a subsidiary of French bank Societe Generale, SG Americas Securities, to serve as financial advisors for the Goldboro venture.

Another LNG export project in Nova Scotia is the Bear Head venture being developed by LNG Ltd of Australia. ■

Jordan Cove LNG engages with other off-takers after Jera and Itochu deals

Pembina Pipeline of Canada, developer of the Jordan Cove LNG export plant proposed for Coos Bay in the northwest US state of Oregon, is advancing with its plans to create a "world-scale LNG export facility to transport North American natural gas to Asia" and it was currently engaging with additional off-takers.

Pembina Corporate Development Officer Stuart Taylor outlined the latest strategy for Jordan Cove at an investor presentation in Toronto.

"Jordan Cove has signed key term sheets with Jera Co Inc. and Itochu Corp. and is progressing in discussions with other potential off-takers," said Taylor.

Jera is the largest Japanese LNG buyer as the procurement arm of the utilities Tokyo Electric Power Co and Chubu Electric.

Japanese trading house Itochu is a long-standing LNG market participant, taking volumes from nations such as Qatar and Oman.

"The lump-sum, turnkey contracts for the LNG terminal were awarded in 2017 and we are currently progressing with the front-end engineering and design process for the Pacific Gas Connector Pipeline," added Taylor.

Pembina said its experienced LNG project contractors included Kiewit Corp. of Nebraska and Black & Veatch of Kansas as well as JGC Corp. of Japan.

The Pembina executive said completion of the FEED process for the pipeline and a final investment decision for the overall project are expected following receipt of regulatory and environmental approvals.

Jordan Cove officially filed its application with the US Federal Energy Regulatory Commission in September 2017 with the company expecting a ruling during the second half of 2018.

Jordan Cove if approved would produce 7.8 million tonnes per annum of LNG for export to Asian markets. ■

Bahrain is on track to become LNG importer even after huge oil and natural gas discovery

LNG Journal editor

Bahrain is moving forward with development of its discovery of extensive tight oil reserves amounting to 200,000 barrels per day and deep natural gas resources of between 10 and 20 trillion cubic feet, though the Gulf kingdom still intends to become an LNG importer by 2019.

Independent appraisals by US-based oil consultants DeGolyer and MacNaughton and oilfield services company Halliburton confirmed in April that Bahrain's find contained "highly significant quantities of oil in place" and deep gas reserves.

Floating storage to be east of Khalifa Bin Salman port

Tight fields

Tight oil is a form of light crude oil held in shale deep below the earth's surface that is extracted with hydraulic fracturing using deep horizontal wells.

"Agreement has been reached with Halliburton to commence drilling on two further appraisal wells in 2018, to further evaluate reservoir potential, optimize completions and initiate long-term production," said the government of Bahrain.

"The newly discovered resource, which officials expect to be in production within five years, is expected to provide significant and long-term positive benefits to the kingdom's economy," it added.

At the same time, Bahrain is pressing ahead with the LNG project in the form of a floating storage unit (FSU) located offshore about six kilometres east of Khalifa Bin Salman port.

The Bahrain LNG project is aimed at supplementing natural gas production in the kingdom and ensuring capacity to meet peak-season demand and industrial growth.

The Bahrain terminal design envisages an LNG vessel acting as a storage facility and with output capacity of up to 800 million cubic feet per day, with onshore and subsea infrastructure.

The investors in the project include Bahrain's Oil and Gas Holding Company, Gulf Investment Corp., Teekay LNG and Samsung Construction & Trading Corp. of South Korea.

Analysts point out that Bahrain is already self-sufficient in its gas supply. However, its current gas consumption is using up most of its existing gas processing capacity.

With increasing gas demand from expansions in the power and industrial sectors, and a declining trend in production from the existing gas field, Bahrain needs to bring online new gas projects or alternatively fill the supply-demand gap by importing LNG from 2019.

"Bahrain's LNG plan is moving ahead, but the kingdom has yet to choose its preferred LNG suppliers and will need to make a decision to define the amount of required LNG and duration of the LNG contracts," said consultants FACTS Global Energy in a report.

"The Bahrain LNG import project, currently under construction, is expected to be onstream in early 2019. The terminal design envisages an LNG vessel acting as a storage facility, with a send-out capacity of 400 mmscf/d in the first phase and 800 mmscf/d of gas in the second phase," said the report.

The project will include the FSU, an onshore LNG receiving facility, a 6.8-kilometre, 24-inch subsea pipeline and a 5.4km, 24-inch onshore gas pipeline.

"In our view even if the deep gas development project materializes around mid-next decade, it may not have a significant impact on the Kingdom's LNG requirements, at least until 2030," said the report. ■

Shell opens first Belgian LNG station in network

Royal Dutch Shell has opened its first Belgian liquefied natural gas filling station at Herstal targeting international road freight traffic as the European fuel network increases, fed by LNG import terminals in the Dutch port of Rotterdam and the Belgian port of Zeebrugge.

The latest Shell station is on the E313 autoroute that connects the Belgian cities of Antwerp and Liege, a key link for international road traffic travelling between France, the Netherlands and Belgium.

The facility has 3,500 tonnes of LNG capacity and can serve up to 150 LNG-powered trucks per day.

"LNG fuel is an important option for transport companies," said Laurent Charlot, Commercial Director of Shell Belgium.

"Shell is committed to thriving throughout the energy transition and LNG will play an increasing role in the energy mix," he added.

"We expect demand for LNG to grow and continue to work with truck manufacturers, customers and policymakers promoting the use of LNG as a cleaner-burning and more affordable transport fuel," said the Shell executive.

"The station in Herstal is an important step in the further expansion of our network of LNG stations in Europe," he stated.

Shell already has seven LNG filling stations in the Netherlands at Rotterdam, Waalwijk, Amsterdam, Pijnacker, Waddinxveen, Eindhoven and Heerenveen. It intends to open further LNG stations in Europe over the next 12 months.

Swedish and Norwegian companies plan August Gothenburg bunkering

LNG Journal editor

Swedish and Norwegian natural gas operators have signed an agreement to start a liquefied natural gas bunkering facility by August at the Port of Gothenburg, one of the busiest in northwest Europe.

Swedegas, the national gas transmission and infrastructure company of Sweden, and Norwegian supplier Barents Naturgass said the LNG fuel station would be operational soon at Gothenburg's Energy Port.

Holdings

"Construction has been in progress since the winter and the facility is expected to become operational in August. Vessels can bunker day and night while loading and unloading," they added.

Swedegas, owner of the pipeline network extending from Dragor in Denmark to Stenungsund in Sweden and supplying 33 municipal areas, intends to expand its presence in the LNG market to meet increasing demands in the maritime sector.

Norway's Naturgass said it would supply the LNG in ISO containers from the main European import terminals to help vessels meet the tightening pollution regulations in the European Emission Control Areas.

The LNG would be brought to the facility using trailers or containers, which would unload at a discharge station.

Fuel will then be distributed to ships via a 450-metre vacuum-insulated cryogenic pipeline to the quays in the Skarvik area at the Energy Port.

Swedegas will own and operate the LNG bunkering station and expects it to gradually replace oil-based fuel products and to make biogas fuel in LNG form also available.

"We always build infrastructure that can handle both natural gas and renewable gas. It will be simple for shipping companies to gradually increase the mix of renewable gas as the transition progresses," said Johan Zettergren, Swedegas Chief Executive.

Swedegas and Nuturgass stated that also intended to expand the facility over time in line with expected market growth in LNG fuel.

"We are very pleased to have the opportunity to work at the largest port in the Nordic region and with the shipping companies that use the port," said Gudrun Rollefsen, CEO of Barents Naturgass.

"Gothenburg-based shipping companies have been amongst the first to adopt LNG in Sweden," added Rollefsen.

US services firm Baker Hughes-GE plans Italian LNG micro-plants for fuel

US energy services company Baker Hughes-GE has signed an agreement with Italian natural gas network company Snam to develop small-scale liquefaction infrastructure to improve Italian supplies of LNG fuel for heavy-duty trucks and maritime transportation.

The agreement was signed by Lorenzo Simonelli, Chairman and Chief Executive of BH-GE and his Snam counterpart Marco Alvera.

BH-GE CEO Simonelli with his Snam counterpart Alvera

Snam manages the first LNG terminal built in Italy in 1969 at Panigaglia, near Genoa, as well as the nation's pipeline network of 32,500 kilometres and its gas storage facilities.

"Snam and BHGE will determine by the end of 2018 the feasibility of the future development of four small-scale liquefaction plants," they said.

"With each almost the size of a football field, these would be the first micro-LNG plants in Italy and among the first of their kind in Europe," added the two companies.

Total annual combined production from the four plants could be around 140,000 tonnes of LNG.

The potential future investment in the four plants could be as much as 80 million euros ($92M), depending on the result of the study.

"With this agreement we want to give a further impetus to the spread of sustainable mobility and to the decarbonisation of the entire heavy transport sector throughout Italy," said Snam CEO Alvera,

"Our goal, in particular, is to make a decisive contribution to the diffusion of a new concept of mobility from renewable sources thanks to biomethane and bio-LNG. The entry into the micro-LNG segment, which can liquefy pipeline gas and biomethane, leverages Snam's European leadership in gas infrastructure," he added.


"Energy is a major cost driver in running an LNG plant. But with efficient Atlas Copco mixed-refrigerant compressors, we're using less energy and saving more money."
Zhang Jia-Hua
Operations Team Leader
Baotou Lu Ding Natural Gas Co. Ltd.
Inner Mongolia, China
Handle the Pressure
Although balancing the mechanics of your LNG plant can put a lot of stress on your budget, Atlas Copco can help you handle the pressure with highly efficient, integrally geared centrifugal compressor solutions that help keep costs under control.
Atlas Copco Gas and Process
www.atlascopco-gap.com
Atlas Copco

Gladstone LNG operator Santos gets back on track with A$400M Bowen Basin investment

LNG Journal editor

Santos, the Australian operator of the Gladstone coal-seam-gas-to-LNG plant in Queensland, said it would invest more than A$400 million (US$302M) with its partners in the Arcadia gas project in the inland Bowen Basin.

The partners of Santos in GLNG joint venture that came on stream in 2015 and produces 7.8 million tonnes per annum of LNG from two processing Trains are French energy company Total, Petronas of Malaysia and Korea Gas Corp.

Arcadia

The A$400M Arcadia investment is in addition to A$900M being spent in 2018 on other upstream developments in the Maranoa, Western Downs and Central Highlands regions of Queensland.

"The Arcadia gas project will create up to 300 construction jobs and local business opportunities in the Central Highlands region, helping to sustain and boost the benefits of Santos' and GLNG's earlier investments," said Santos Chief Executive Kevin Gallagher.

Santos CEO Kevin Gallagher outlines future plans

The upstream GLNG investment is the first major development announced since Santos managed to see off a US$10.8Bln takeover offer during the last week in May from US equity fund Harbour Energy.

The project is located near the town of Injune, about 680 kilometres northwest of the East Coast city of Brisbane.

It will involve drilling 137 new wells and constructing a 140km network of gas and water gathering facilities, a new compression station, a water treatment plant, a 5 megawatts gas-fired power station and associated local roads and infrastructure, including two 4G communication towers.

Gallagher said the decision to sanction the GLNG project followed a very successful 13-well pilot programme which tested changes to the planned well design and operating methods.

"We have reduced our connected well costs in Queensland by more than 70 percent since 2015 to become Australia's lowest-cost onshore operator," added Gallagher.

"If you want to put downward pressure on gas prices, reducing the cost of supply is a good place to start," stated the Santos CEO.

"Santos will apply our low cost operating model, and a well design and water management approach tailored for the Arcadia field, to extract more gas for less money," said Gallagher.

"Santos is delighted to support jobs and investment in regional Queensland and we want to continue to invest here for many years to come," he added.

Santos recovers share equilibrium as US equity fund Harbour Energy ends interest in takeover

Asian Pacific LNG stakeholder Santos, the Australian company that was the subject of a US$10.8-billion bid from US equity fund Harbour Energy backed by its parent EIG Global, saw its shares rise by 2 percent on May 30 as corporate normality returned after the offer was withdrawn last week because of the high oil price.

A latest statement to the Australian Securities Exchange said only that Harbour Energy was no longer a substantial shareholder, signalling that it had off-loaded its initial stake.

Analysts said the potential takeover of Santos and its shares in the Gladstone LNG plant in Queensland, the Darwin LNG facility in the Northern Territory and the Papua New Guinea plant was withdrawn because of the refusal by Adelaide-based Santos to abide by Harbour's oil hedging request.

Santos shares had dropped on May 23 after it rejected the Harbour offer, wiping more than A$1 billion off the value of its shares.

The shares were last at A$5.69 from A$5.58 at the previous close. The current share price puts Santos on a lower market value compared with other prominent LNG stakeholders listed on the Australian Securities Exchange such as Woodside Petroleum, Origin Energy and Oil Search.

Santos had on May 21 received its sixth conditional proposal from Harbour by way of a scheme of arrangement for consideration of US$5.21 per share, equivalent to A$6.95 per share.

However, the revised Harbour proposal was conditional on Santos undertaking additional hedging of oil-linked production in 2018 of around 30 percent and changes to hedging in 2019.

In addition, Harbour indicated the offer price would be increased to a US dollar amount equivalent to A$7.00 per share if Santos agreed to hedge 30 percent of oil-linked production in 2020.

That speculative price put by Harbour on Santos shares of A$7.00 was never reached as the highest price on the ASX was A$6.46 per share.

Harbour failed to offer enough of a premium as oil prices climbed towards $80 per barrel.

The price of oil had been at $52 a barrel when Harbour made its first approach to Santos in August 2017.

Harbour had also planned to borrow its money for the deal, a loan which required the hedging Harbour requested and which was refused by Santos and its Chief Executive Kevin Gallagher.

Santos has previously received tentative bid interest from Chinese companies, the ENN Group and Chinese equity fund Hony Capital.

Santos had also rejected a A$7 billion takeover offer in 2015 from the Brunei and United Arab Emirates-backed Sceptre Partners.

Harbour Chief Executive Linda Cook, a former Royal Dutch Shell executive, left Australia without making a comment and vacated her temporary headquarters at Suite 2001 at 1 Macquarie Place in Sydney.

Equity fund company Harbour has its offices registered as Cricket Square on Grand Cayman on the Cayman Islands.

Harbour had completed a transaction at the end of October 2017 to buy Royal Dutch Shell's oil and gas assets in the North Sea for around $3Bln - while it failed on the crucial final lap of its Santos pursuit.