

# LNG Unlimited

LNG JOURNAL PUBLICATION

26 February 2019

## Teekay anticipates more revenue from Bahrain LNG and newbuilds

Teekay Partners post over 14 percent rise in annual cash flow of \$515.3M from fleet  
**LNG Journal editor**

Teekay LNG Partners, the carrier fleet operator, posted a more than 14 percent increase in total cash flow from vessel operations of \$150.1 million in the fourth quarter and \$515.3M for all of fiscal 2018 as it forecast rising income from the company's stake in the Bahrain LNG import project in the Gulf.

Teekay is one of four shareholders in the Bahrain LNG joint venture, scheduled to become operational this year.

### Positives

The company said earnings were positively impacted by the deliveries of 12 LNG carrier newbuilds to the Partnership's consolidated fleet and equity shares in vessels between October 2017 and December 2018.

"Once again this quarter, our cash flows and adjusted earnings were up significantly over the prior quarter as the Partnership's LNG segment grew and certain existing vessels commenced new contracts at firm rates," said Mark Kremin, President and Chief Executive of the Teekay Gas Group.

The Teekay LNG carrier fleet comprises 45 vessels, including newbuilds and in-charter ships, while its liquefied petroleum gas and multi-gas fleet numbers 29 ships.

"This segment continued its expansion in early-2019 with the delivery of two additional newbuilding LNG carriers, including the 'Yamal Spirit', which was delivered on January 31," added the CEO.



'Sean Spirit' was built at Korea's Hyundai Samho yard

Kremin explained that with a full financing facility now in place, the Partnership has completed all of the necessary financings to take delivery of its entire newbuilding orderbook which, at its peak, amounted to around \$3 billion.

"We expect our LNG segment results to be significantly higher in 2019 primarily due to the delivery of 15 newbuilding LNG carriers during 2018 and throughout 2019 as well as the start-up of the Bahrain LNG regasification terminal in 2019," stated Kremin.

Bahrain is completing the construction of its first LNG import facility at a location about 5 kilometres from the existing breakwater at the Khalifa Bin Salman Port.

The facility will also include a floating storage unit (FSU) and a regasification platform.

The Bahrain LNG consortium comprises four companies, the Gulf state's National Oil & Gas Authority (30 percent), Teekay LNG (30 percent), South Korea's Samsung C&T (20 percent) and the Gulf Investment Corporation (20 percent).

In an overview of its shipping activities, Teekay said the "Torben

Spirit' commenced its minimum three-year charter in January 2019 at a charter rate in excess of \$100,000 per day for the duration of the contract.

Among carrier newbuild deliveries during the fourth quarter, the Partnership took delivery of one M-Type, Electronically Controlled, Gas Injection (MEGI) LNG carrier newbuilding, the "Sean Spirit", which immediately commenced its seven-year charter contract with BP Gas Marketing.

### Stake

Teekay also has a 20 percent stake in another carrier, the "Pan Africa", which immediately commenced its 20-year charter contract in January with Royal Dutch Shell.

Another MEGI-powered carrier, the "Yamal Spirit", has started its 15-year charter with Yamal Trade of Russia.

"Concurrent with that delivery, the Partnership entered into a \$159M, 15-year sale-leaseback financing arrangement with a lessor, which added \$30 of liquidity to Teekay LNG," it said.

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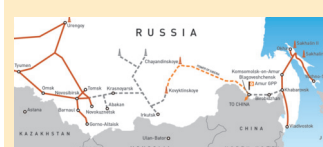
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# Australian player Origin sells Ironbark feed-gas to APLNG and partners Sinopec and ConocoPhillips

LNG Journal editor

Origin Energy, a stakeholder in the Australia Pacific LNG plant with ConocoPhillips and China's Sinopec, said it agreed to sell its Ironbark gas project in Queensland to the APLNG project to provide additional feed-gas.

Origin, which holds about 37.5 per cent of the coal-seam-gas-to-LNG joint venture, said the sale price was A\$231 million (US\$164.4M) and that it would remain responsible for the development of Ironbark due to its role as an upstream operator for APLNG.

## Surat Basin

Ironbark is located in Queensland's Surat Basin and Origin announced in August 2018 that it had entered the front-end engineering and design phase for the project while also assessing alternative strategic options.

The Ironbark project could produce CSG from 800 new gas wells in the next 30 years in addition to the



Australia Pacific plant on Curtis island started in 2016

nearly 10,000 wells Origin is drilling with ConocoPhillips as feed-gas supply for the APLNG plant.

The Ironbark project is expected to have a revised multi-stage field development plan initially targeting a sweet spot known as the Undulla Nose in the North West sector of the field.

"The sale represents the best way for Origin to maximise value from Ironbark," said Origin Chief

Executive Frank Calabria.

"APLNG is able to realise additional value from the asset by utilising its existing nearby gas and water processing infrastructure to efficiently bring the gas to market," explained Calabria.

"Origin will derive value from the development of the Ironbark asset through its investment in APLNG," he added.

Based on the sale price, Origin

said it expected to book a non-cash post-tax impairment of A\$34 million in the 2019 fiscal half-year financial statements.

"The net impact to statutory profit will be offset by a A\$68 million benefit to tax expense," said the Sydney-based company.

Origin owns 37.5 percent of APLNG, the same shareholding as ConocoPhillips while Sinopec has a 25 percent stake.

The CSG for the plant on Curtis Island, near the port of Gladstone, is transported from the Bowen and Surat basins of central Queensland by a 530 kilometres pipeline.

The APLMNG plant, which shipped its first cargo in January 2016, has two LNG processing Trains, each with nameplate production capacity of 4.5 million tonnes per annum.

There are two 20-year supply agreements in place for the LNG. One is with Sinopec for 7.6 MTPA and one with Japanese utility Kansai Electric for 1 MTPA.

# Gladstone LNG operator Santos posts solid annual profit and drills 305 CSG wells for more feed-gas

Santos, the Australian operator of the Gladstone liquefied natural gas plant in Queensland and a stakeholder in export plants in Darwin and Papua New Guinea, returned a solid annual net profit and boosted sales by 18 percent.

"The full-year results demonstrate delivery of our strategy to drive sustainable shareholder value by establishing a low-cost, high-performance operating model that generates strong cash flows through the oil price cycle," stated Santos Chief Executive Kevin Gallagher.

Santos said underlying profit after tax more than doubled to a record US\$727 million from US\$318M in 2017 and the Adelaide-based company said it was on a

firm path to grow production and reserves.

Net profits amounted to US\$630M versus a loss of US\$360M in 2017. Sales rose by 18 percent to US\$3.66Bln from US\$3.10Bln in 2017.

Gallagher said the recent completion of the acquisition of Australian company Quadrant Energy and its West Coast assets would provide a significant boost in Santos's production in 2019.

Gallagher also praised the development efforts tied to the performance of the Gladstone LNG plant it operates in Queensland and whose other shareholders are Petronas of Malaysia, Korea Gas Corp. and French major Total.

"At GLNG, our low-cost, effi-

cient operations continue to support a development plan to unlock more gas over time," said Gallagher.

"In 2018, we drilled a record 305 wells, 77 percent higher than 2017," he added.

"During the year the 480-well Roma East field development was sanctioned with 121 wells drilled by year-end and the Scotia CF1 field project delivered one year ahead of schedule and 16 percent under budget," stated the CEO.

"In Northern Australia, Darwin LNG remains an important and strategic infrastructure project for the future development of onshore and offshore resources. Plant performance in 2018 was again strong with LNG production

higher than 2017," he added.

"The Barossa project is being progressed as the lead candidate to backfill Darwin LNG with a final investment decision targeted by late 2019 or early 2020," explained Gallagher.

He said that the Papua New Guinea plant had a record daily production rate equivalent to 9.2 million tonnes per annum from the two Trains in the second half of the year. This followed upgrading work on the plant.

"PNG LNG expansion opportunities continue to be progressed with provisional results from the Muruk-2 appraisal well indicating the objective Toro reservoir is likely hydrocarbon bearing," added Gallagher.

## East Coast of India LNG terminal set for first cargo

Indian Oil Corp., the refining and fuel marketing company, is set to begin commissioning of the first liquefied natural gas import terminal on the East Coast of India near the city of Chennai.

Executives said that state-owned Indian Oil has purchased an LNG cargo for commissioning, reportedly from Equatorial Guinea.

The new terminal is located at Kamarajar Port in the south-east state of Tamil Nadu.

The company said that the LNG facility at Kamarajar Port, formerly one of India's main coal ports and previously called Ennore, will have annual capacity of 5 million tonnes per annum once commercial operations begin.

The Kamarajar terminal, which will be India's sixth, is expected to spur industrial growth in the area with the regasified LNG to be distributed to power generation plants, fertiliser plants and other industrial units.

Indian Oil is the main stakeholder in the facility, though other investors have been named as the Indian private equity fund, IDFC Alternatives, and ICICI Bank, part of an Indian multinational banking and financial services based in Mumbai.

Once the Kamarajar LNG terminal is fully commissioned it will join the five other facilities on the West Coast at Dahej, Dabhol, Hazira, Mundra and Kochi to supply India's growing natural gas needs.

Analysts said the coming on stream of this first regasification terminal on the East Coast would be a landmark in Indian Oil's efforts to improve natural gas infrastructure in the country.

## Woodside remains on track with new US\$30Bln West Coast spending plan

LNG Journal editor

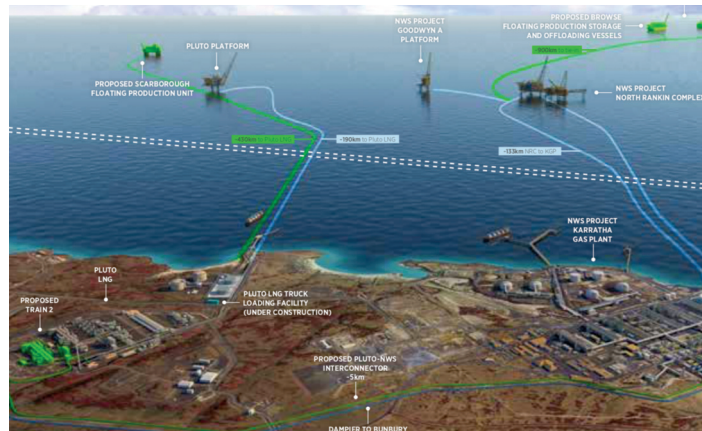
Woodside Petroleum Chief Executive Peter Coleman said that after the company's strong performance in the past year it was looking forward to sanctioning more than US\$30 billion of new liquefied natural gas projects.

After a year that marked the delivery of the 5,000th LNG cargo from the North West Shelf plant in Western Australia, Coleman said 2020 would see the company embark on two new liquefaction, export and domestic gas ventures.

### Browse Basin

Woodside said that its Browse Basin plans to provide additional feed-gas for the North West Shelf LNG plant would cost around \$US20.5Bln and the Scarborough gas field project, including the expansion of Pluto LNG, would cost about \$US11Bln.

The Australian company would retain 30.6 percent of Browse and the 50 percent of the Scarborough venture so that its investments would amount to about US\$12Bln.



Plan for Burrup LNG and gas Hub in Western Australia

However, Coleman stated that the costs would not be fixed until the current front-end engineering and design contracts were completed.

"I don't want the market to run away from me if the price goes up," said Coleman.

"You know these contractors don't need much of a signal in pricing for their costs to go up," he stated.

The Scarborough and Browse projects together would produce about 16 million tonnes per annum

of LNG, starting in 2024 and 2026 respectively.

Coleman added that another issue that had to be settled was whose feed-gas would keep the North West Shelf LNG plant running at full capacity from 2022 before the Browse Basin gas arrives in 2026.

The CEO noted in his briefing on the past year's activities that Woodside's net profit increased 28 percent year-on-year, driven by robust operational performance and improved market conditions.

## Santos boosts exploration permits in Bonaparte Basin for LNG needs

Santos, the Australian LNG plant operator and stakeholder, said it reached an agreement to align the company's interests, under Santos operatorship across four exploration permits in the Bonaparte Basin offshore Northern Australia adjacent to large existing natural gas resources set to be developed for liquefaction and export.

Santos explained that its position in the Bonaparte Basin already includes an 11.5 percent interest in the Bayu-Undan gas-condensate field and in the onshore Darwin LNG plant, as well as having a 25 percent interest in the Barossa gas field.

A Barossa field project is currently in its front-end engineering and design stage and is the leading candidate to backfill the Dar-

win LNG export plant, operated by ConocoPhillips since 2006 in the Northern Territory and in which Santos is a shareholder.

Santos has signed an agreement with Beach Energy of Australia that will see the companies become 50-50 joint venture partners across four licences NT/P82, NT/P85, NT/P84 and WA-454-P. Santos will operate all four permits.

Santos added that the NT/P82 and NT/P85 permits are located immediately to the south of the Barossa project area, where Santos acquired the 4,347 square kilometres Bethany 3D seismic survey in 2018.

The other two permits are close to the Petrel, Tern and Frigate field complex in the Petrel

sub-basin, where separate agreements with Europe-based Neptune Energy see Santos move to 100 percent operated interest in the Tern and Frigate fields and a 40.25 percent interest in the Petrel field, subject to final approvals.

"This alignment of equity and operatorship will allow for a more strategic approach to the next phase of exploration in the region," said Santos Chief Executive Kevin Gallagher.

"It also reinforces Santos' significant exploration and existing substantial resource position in offshore Northern Australia and is a good example of industry collaboration aimed at doing things smarter," added Gallagher.

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## NEWS NUDGES

### Mexican LNG exports

The California-based US utility Sempra Energy is still on track to transform its Costa Azul LNG import terminal on the Pacific Coast of Mexico into an export plant. Sempra's Mexican projects subsidiary, Infraestructura Energeica Nova (IEnova), reaffirmed the plans in its fourth-quarter report where it noted a 14 percent increase in earnings to US\$207.9 million. On the Costa Azul LNG project, IEnova said a final investment decision was still scheduled for late 2019 with potential first LNG shipments in 2023.

### Korea LNG newbuilds

South Korea's shipbuilding merger between Hyundai Heavy Industries and Daewoo Shipbuilding & Marine Engineering is expected to double the value of the combined company's outstanding orders for LNG carriers to more than US\$12 billion, according to industry data. Hyundai is set to formally sign an agreement early in March 2019 to buy a controlling stake in Daewoo Shipbuilding from state-run Korea Development Bank. KDB is Daewoo Shipbuilding's main creditor with a 55.7 percent stake in the company.

### Centrica US cargoes

Centrica, the UK-based utility and energy company, said its Energy Marketing and Trading business would start receiving cargos from the US Sabine Pass facility in Louisiana in September 2019 when its supply agreement comes into force. Centrica noted in the latest earnings report that in February 2019 it also signed a full sales and purchase agreement for volumes from 2023 from the Mozambique LNG project in southeast Africa, in partnership with Japanese utility Tokyo Gas.

## Senegal-Mauritania LNG partners Kosmos name new exploration head

### LNG Journal editor

Kosmos Energy, a main partner in the BP-led floating liquefied natural gas projects offshore Senegal and Mauritania in West Africa, has announced key management changes as its FLNG proposals move forward.

Kosmos said that its Chief Exploration Officer and founding partner Brian F. Maxted had decided to retire.

### Retirement

The Dallas, Texas-based company said that Maxted would remain on the Board and continue to serve as a special advisor on matters related to exploration.

Kosmos named his successor as Tracey Henderson who joined Kosmos in 2004.

The company said Henderson had served as a key member of the technical team responsible for the discovery of the Jubilee field in Ghana, the Greater Tortue-Ahmeyim field in Mauritania and Senegal and the Yakaar field in Senegal.

Kosmos and BP decided in De-



**Brian F. Maxted retires and Tracey Henderson takes place**

cember 2018 to proceed with investing in the cross-border Greater Tortue and Ahmeyim gas fields to produce LNG with the governments of Mauritania and Senegal.

The Greater Tortue-Ahmeyim project first phase will produce gas from a deepwater subsea system and transfer it to an FLNG hull at a nearshore hub located on the Mauritania-Senegal maritime border.

The first of several FLNG facilities is designed to produce around 2.5 million tonnes per annum of LNG from recoverable gas in the fields estimated to be around 15 trillion cubic feet.

Kosmos Chairman and Chief Executive Andrew G. Inglis credited outgoing Chief Exploration Officer



Maxted with giving the company its success.

"On behalf of the entire Board and all Kosmos employees worldwide, I would like to thank Brian for his dedication to Kosmos since its founding and the excellent record of exploration success he has delivered," stated Inglis.

"I am pleased that Tracey is taking over as Chief Exploration Officer. She embodies all of the exploration leadership attributes that have made Kosmos successful," said Inglis.

Reflecting on his time with the company, Maxted said he was very proud of what Kosmos had achieved since it was founded in 2003.

## Annova LNG at Brownsville Ship Channel makes progress on power

The US Annova liquefied natural gas export project planned for the south bank of the Brownsville Ship Channel in Texas, and whose owners include Chicago-based power company Exelon Corp., has signed a facilities agreement to book all the transmission needs of the plant.

Annova's accord is with the South Texas Electrical Cooperative (STEC) for 405 megawatts of power for the export plant with capacity to produce 6.0 million tonnes per annum of LNG.

"The Annova LNG project has a significantly lower environmental impact on the Rio Grande Valley than other proposed projects due to its use of electrical power in-

stead of natural gas to drive its liquefaction compressors," said Omar Khayum, Annova Chief Executive.

"We are confident that through the executed agreement, STEC will provide all electric transmission services required for safe and reliable operation of the project," added Khayum.

Annova added that Magic Valley Electric Cooperative, a member of STEC, will be the sole provider of electric energy to power the facility.

"This agreement is yet another example of Annova LNG's momentum," said Khayum.

"The project continues to make significant progress as we

begin 2019," he stated, noting that commercial operations are scheduled to begin in 2024.

Annova received its draft environmental impact statement in December 2018 prepared by the Federal Energy Regulatory Commission.

The project company added that it had modified its layout to create a 185-acre environmental conservation corridor and avoid impacting over 100 acres of wetlands.

Its environmental plans would also restore tidal exchange and estuarine habitats lost when the Brownsville Ship Channel and State Highway 48 were constructed.

# Noble Energy of US advances with East Med and Equatorial Guinea natural gas projects for LNG

## LNG Journal editor

Noble Energy, the US exploration and production company with interests offshore the East Mediterranean and Equatorial Guinea, reported higher annual sales and said the first phase of the Leviathan project offshore Israel was on track.

Noble also said the Leviathan venture had sales agreements in place for more than 1 billion cubic feet per day equivalent.

## Sales accords

It additionally executed gas sales agreements for up to 700 million cubic feet per day of natural gas to customers in Egypt from the existing Israeli Tamar natural gas field and the Leviathan field.

The Leviathan field was 75 per cent complete in the overall development project and the first phase is scheduled to come on stream at the end of 2019.

Some of the Israeli natural gas is expected to be used in Egypt for liquefied natural gas exports or to boost domestic supplies, clearing the way for LNG shipments.



**Noble's Chairman and Chief Executive David L. Stover**

The Houston, Texas-based company also said it had negotiated accord in the form of a Heads of Agreement to progress with development of natural gas from the Alen field offshore Equatorial Guinea. Some of the gas will be processed at the LNG plant on Bioko Island.

Noble posted annual sales volumes worth \$4.46 billion compared with 4.06Bln in 2017.

Fourth-quarter sales were lower at \$1.05Bln versus \$1.14Bln in the prior-year quarter.

Noble returned more than \$500M to shareholders, including \$295M through the company's share repurchase and \$208M in a share dividend.

"We strengthened the company's balance sheet by paying down \$609M in Noble Energy debt," said the company.

Noble reported a fourth-quarter loss of \$824 compared with a profit of \$494M in the same quarter of 2017.

Its annual net losses dropped to \$66M from \$1.11Bln in 2017.

"Noble made significant strides in 2018 as the company continued to preserve returns over volume growth across our global portfolio," said David L. Stover, Noble Chairman and Chief Executive.

"This was evidenced in the second half of the year as we moderated our US onshore activity to protect margins," he said.

"Offshore Israel, we are nearing the start-up of the world-class Leviathan project, which is scheduled to deliver first gas by the end of 2019," stated Stover.

"In addition, we executed pipeline agreements that will enhance our delivery of natural gas to the region," said the CEO.

Noble's sales volumes for the fourth quarter were 350 thousand barrels of oil equivalent per day, driven primarily by production in the US onshore DJ and Delaware Basins in Colorado and Texas respectively.

The company's US onshore assets produced 72 percent of sales volumes, Equatorial Guinea represented 17 percent and Israel comprised 11 percent.



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## Japanese and French sign Equinor for LNG fuel

The Japanese-French European LNG bunkering joint venture of Mitsubishi Corp, NYK Line and the utility Engie has signed a firm deal to sell fuel for LNG-powered crude oil shuttle tankers owned by Norwegian energy company Equinor.

Equinor's deal is for bunkering for four shuttle tankers, mainly in the Dutch port of Rotterdam.

Equinor, which itself operates the Hammerfest LNG production plant in northern Norway, said its vessels are scheduled to enter service in early 2020 and will operate in Northwest European waters within an Emission Control Area covering the Baltic and the North Sea.

The vessels also enter operations at the start of the global sulfur cap being introduced from 2020 under International Maritime Organization rules.

The Japanese-French maritime fueling venture for LNG, known as "Gas4Sea", has operated with one bunkering vessel called "Engie Zeebrugge" since 2017.

The 5,000 cubic metres capacity ship is based in the Belgian port of Zeebrugge where it performs ship-to-ship bunkering operations.

The first customer of the Engie-led bunkering venture was United European Carriers (UECC) for several LNG-powered vessels it operates.

"Gas4Sea is a commercial brand to develop the use of LNG as a sustainable, reliable, safe and cost-effective alternative to conventional oil-based marine fuels," said Engie.

"Its purpose and ambition is to accompany the shipping sector in the upcoming transition towards a greener maritime environment, in Europe and worldwide," added the French company.

## LNG Canada contractor JGC of Japan posts modest results

LNG Journal editor

JGC Corp. of Japan, one of the leading global energy engineering companies, has posted lower sales and income in the third quarter of its fiscal year as it prepared to take on the LNG Canada liquefaction and export project in British Columbia.

JGC, which has recently been working on the Ichthys LNG venture in Australia and the Russian Yamal project, reported disappointing results, though better than those of its Japanese peer Chiyoda Corp.

### Backlog

Fiscal third-quarter sales for JGC amounted to 424.6 billion yen (\$3.85Bln), down 20 percent from 531.0Bln yen in the prior-year quarter.

Operating income was also down in the third quarter at 15.2Bln yen (\$137.7 million) from 21.6Bln yen (\$195.7M) in the fiscal 2017 quarter.

"Due to the drop in the amount of backlog up to the last fiscal year, there was a reduction in both revenue and profit on a year-on-year basis, but profit items are in line with the full-year forecast," JGC explained.



Fluor Corp. President Jim Brittain, LNG Canada CEO Andy Calitz and JGC's CEO Masayuki Sato at the LNG Canada contracts signing ceremony (Photo Shell)

JGC was awarded the contract with Fluor Corp. of the US for the LNG Canada project to be located at a brownfield site near the town of Kitimat.

Experienced player JGC, is also working on the Coral floating LNG venture offshore Mozambique for Italian energy company Eni and partners after being a contractor on the world's first FLNG project for Petronas offshore Malaysia.

"The account balance was 120.8Bln yen in cash and bank deposit, and together with short term investment balance on loans receivable, this shows a total cash and cash equivalent of 140.8Bln yen which represents a decrease of

94.5Bln yen from the balance at the beginning of the year," JGC stated.

"The major reasons for the decrease were the payment conditions for equipment costs for projects in Algeria, the advance payments made for the Ichthys LNG project and short-term debt repayments," it explained.

"In addition, we have joint venture accounts which amount to 102.1 billion yen according to our interest base, but which are not booked on our balance sheets," said the company.

JGC added that it was pleased to receive the LNG Canada project contract in British Columbia.

## Kwispaa LNG project planned for Vancouver Island pauses activities

Steelhead LNG has stopped work on the Kwispaa LNG project in Sarita Bay on Vancouver Island's west coast, casting some doubt on the future strategy of the joint venture on the Pacific coast province of British Columbia.

Steelhead LNG spokesman Matt Skinner said the decision to cease work on the Kwispaa project has come down to economics.

"Given the current environment in BC, investors really need a greater degree of certainty before investing in a project such as ours," he said.

"We've paused work on Kwispaa for now and are evaluating," added Skinner.

Steelhead and its Kwispaa LNG unit had set up a venture with a native partner, the Huu-ay-aht First Nation. The Huu-ay-aht said they were "deeply disappointed" by the halt in the project.

"We are saddened by the decision of Steelhead LNG. The Huu-ay-aht First Nation is a self-governing, modern treaty Nation and we will continue to pursue our vision of establishing a healthy, prosperous and self-sustaining community," said a statement from the First Nation's leaders.

Steelhead had proposed a near-shore export plant on Vancouver Island, backed by a pipeline to bring feed-gas from the Chetwynd

area of northeast BC to Sarita Bay on First Nation-owned land.

The company had been planning to submit environmental assessment applications for the liquefaction and pipeline projects with combined estimated costs of C\$18 billion (UD\$13.5Bln). A final investment decision was scheduled for 2020.

The construction phase would have taken approximately four years and the plant and pipeline were scheduled to come on stream by 2024.

Steelhead is a private firm based in Vancouver and has held a gas export license from the Canadian National Energy Board since 2016.

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## Gazprom expects Far East gas pipeline to China will be competing with LNG by start of December

## LNG Journal editor

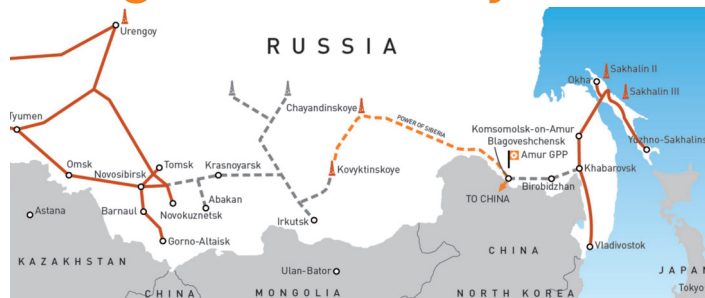
Gazprom, the Russian natural gas company, and China National Petroleum Corp. have held talks about pipeline supplies from Russia that would eventually challenge LNG shipments and Gazprom now expects the pipeline gas to start flowing by the start of December 2019.

The talks were in Beijing between the Gazprom delegation, headed by Chairman Alexey Miller, and a group of CNPC executives led by Chairman Wang Yilin.

## ‘Power of Siberia’

Gazprom said the parties reviewed a wide range of issues related to cooperation between the companies, focusing on the ongoing preparations for the start of gas supplies to China via the “Power of Siberia” gas pipeline.

“Construction of the ‘Power of Siberia’ pipeline is going ahead of schedule, and Gazprom will start delivering gas to China well in



### China has 30-year accord for initial 38 Bcm a year of gas

advance, as early as December 1, 2019,” said Gazprom’s Miller.

Gazprom and CNPC signed the 30-year Sales and Purchase Agreement for Russian gas in May 2014 to be supplied via the eastern route, the Power of Siberia gas pipeline, and would amount in volumes of 38 billion cubic metres per annum.

Gazprom said particular attention at the meeting was paid to the planned deliveries of Russian gas to China from the Far East and via the western route.

It was noted that in 2018 China became the world's largest natural gas importer with its imports, combining pipeline gas and LNG,

totaling 125.7 billion cubic metres, a 31 percent increase on 2017.

CNPC's Russian pipeline contracts with Gazprom are in addition to its stake in the latest Russian LNG export project, the Yamal plant on the Arctic coast of Siberia. Yamal is operated by the second-largest Russian natural gas company, Novatek.

"This Chinese growth in imports was achieved primarily because China is currently unable to satisfy its rising gas demand using the existing gas pipelines," said Gazprom, in reference to pipelines from Central Asian republics such as Turkmenistan.

Gazprom said the “Power of

Siberia” pipeline was around 95 percent complete with about 2,000 kilometres now installed and connected in the linear section running from Chayandinskoye, the gas fields centre in the Russian Far East, to the Chinese border in the Amur Region.

The eastern route for Russian gas exports to China has additionally involved establishing major gas production centres.

Prior to being fed into “Power of Siberia” pipeline natural gas will undergo treatment, producing valuable petrochemical and other components.

For that purpose, Gazprom is building the Amur Gas Processing Plant, the largest such plant in Russia and second-biggest in the world.

Gazprom said that Miller and Wang also used the latest talks in Beijing to discuss their collaboration in the areas of gas-fired power generation, use of natural gas as a vehicle fuel and underground gas storage.

## China National Petroleum gives details on storage plans to help manage LNG and gas distribution

China National Petroleum Corp., the world's third-largest energy company, plans to build 23 new natural gas storage facilities and expand 10 existing ones to help the nation have flexibility in its network for LNG imports and pipeline gas.

CNPC, the company with a stake in the Yamal LNG project in Russia and in Mozambique LNG in southeast Africa, said the new storage would give additional working gas capacity exceeding 15 billion cubic metres by 2030.

The move aims to help meet the rising demand for natural gas in China to help economic expansion and the increasing replacement of coal by natural gas to reduce pollution, especially during winter in the northern cities.

### The CNPC natural gas storage

plans were outlined in a statement on February 17 published by the Xinhua news agency.

CNPC is the largest natural gas producer and supplier in China, providing more than 71 percent of China's gas supply and operating 76 percent of China's gas pipeline.

It is also the largest oil and gas pipeline contractor and operator with a natural gas pipeline network of more than 53,000 kilometres.

However, natural gas storage capacity is regarded as inadequate to provide for peak supply needs, given the size of the national gas network.

CNPC, the parent company of PetroChina, said that part of its plans was to build six regional gas storage centres across China. The most suitable regions for under-

ground storage are in areas where more depleted gas wells could be used.

China currently operates 25 storage facilities with total designed working capacity of 18.9 Bcm and working volume of 11.7 Bcm, more than double the capacity that existed in 2015.

This is still inadequate at less than 5 percent of the total gas consumed compared with 20 percent in the US.

Most of the facilities in operation were built using depleted gas wells. Only a few use salt caverns which require higher building costs and take much longer to construct.

CNPC said it was gradually establishing a diversified gas supply system to satisfy the increasing demand for gas.

The PetroChina unit operates three LNG terminals, two in the northeast at Tangshan in Hebei Province and Dalian in Liaoning province. The third LNG facility is in the east at Rudong in Jiangsu province.

The country aims to make natural gas consumption account for around 10 percent of the country's energy mix by 2020 and 15 percent by 2030.

China's natural gas consumption surged in 2018, rising by 18 percent to 280.3 Bcm, according to the National Development and Reform Commission.

Chinese LNG imports rose by 38 percent in 2018 as shipments surged in the final two months of the year.