LNG North America

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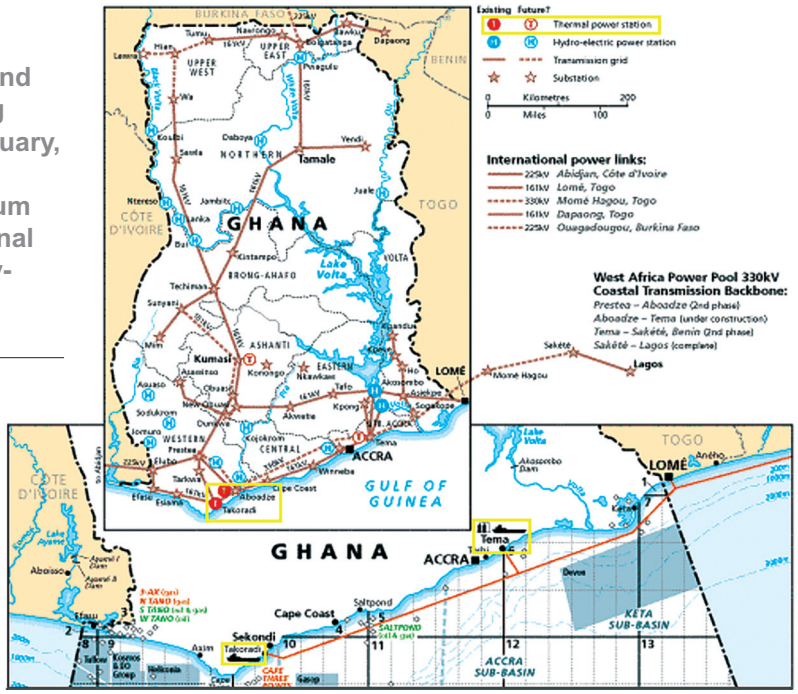
Analysis: Ghana explores all options to import LNG

Bogged down by persistent gas shortages, Ghana is fast-tracking alternative options to energise the country: importing LNG via two Floating Storage and Regasification Units (FSRUs) as well as generating electricity on barge-based gas power ships. In January, construction started on the $1.5 billion container terminal at Tema Port – groundbreaking for Quantum Power's adjacent 3.4 mtpa Tema LNG import terminal took place in early March. Snapping up attractively-priced spot cargoes, including US LNG, seems the operators' ultimate aim.



source: geni.org

Ghana, by the sounds of its ambitious energy minister John Abdulai Jinapor, aspires to tap global LNG markets and seeks to import cheap spot cargoes from a variety of sources. Shell, BP, Total and other LNG portfolio players, or some of the international gas trading firms like Trafigura, Vitol, Glencore and Noble are hoped to help Ghanaian buyers get their hand on short-term supply, including from the US Gulf Coast.

Eager to boost gas-fired power generation capacity, the Ghanaian energy minister is pushing for at least one FSRU: "Nothing prevents us from putting two LNG regas facilities in place," Mr Jinapor touted at an industry at a conference in London in October. He suggested that once these two FRSUs got going there would be sufficient gas to restart the 126 MW Tema Power Plant, which used to rely on supply through the West Africa Gas Pipeline (WAGP), as well as the 550 MW Takoradi Power Station on Ghana's western coastline. Mr Jinapor said at the time the first FSRU would be in place by the turn of the year 2016/17 – but his timeline proved overly ambitious.

Long lead-time for Tema LNG

The LNG import project at Tema Port has been in the making for four years. On March 6, 2017, Quantum Power broke ground on the Tema LNG Terminal, consisting of facilities for the import, storage and regasification of up to 3.4 mtpa liquefied natural gas. The project is being realised on a built-own-operate-transfer basis with

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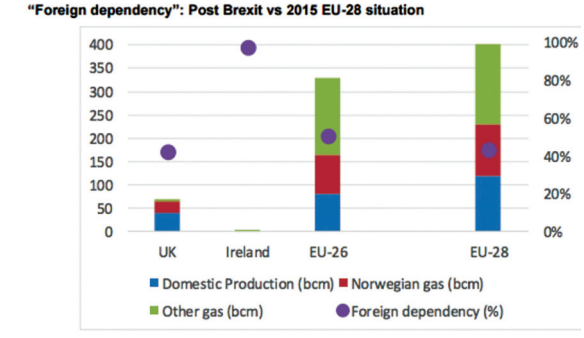
Brexit might cause 'issues of gas foreign dependency'; OIES report

In a world awash with LNG, the UK's Brexit negotiations do not specifically focus on energy security, however "as the LNG supply and demand balance is forecast to tighten during the 2020s, the UK and Irish agendas should then be concentrated on security of supply," warns Thierry Bros, senior research fellow at the Oxford Institute of Energy Studies (OIES).

"In a world awash with LNG the issue of security of supply is not the primary issue in Brexit negotiations" however "as the LNG supply and demand balance is forecast to tighten during the 2020s, the UK and Irish agendas should then be concentrated on security of supply," he warns in an OIES paper named 'Brexit's impact on gas markets'.

"As soon as Brexit is formally completed, the UK will still have its own domestic gas supply but will also need to access foreign gas



Source: Net flows from BP Statistical Review June 2016, thierrybros.com

"Foreign dependency": Post Brexit vs 2015 EU-28 situation

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AGENDA

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Ghana National Petroleum Corp (GNPC) as the customer in its role as Ghana's national gas aggregator.

Delays have also hit other large infrastructure projects in Ghana: The FSRU Golar Tundra has been lying idle off the coast for over ten month by now; the ship's charter, West Africa Gas Ltd (WAGL) has failed to complete works of a connecting pipeline, jetty and breakwater which impedes the FSRU start-up.

Golar said it is now in talks with WAGL about a later start-up and a charter extension. The Norwegian shipping company warned, however, that "to mitigate the consequences of non-payment, it has requested and awaits WAGL's permission to trade the ship in the short term market."

Competing gas power projects

The port city of Tema, situated just 20 miles east of Ghana's capital Accra, serves as the country's hot bed for new gas and power projects: Ghana National Petroleum Company (GNPC), the appointed gas aggregator by the government, is currently negotiating the Tema LNG project which is envisaged to utilize an FSRU located offshore with ship-to-ship-transfer of LNG in an open ocean environment.

The Kpone Independent Power Plant (IPP) is also underway in Tema. The projected 340 MW multi-fuel plant, developed by Group Five and built by WorleyParsons, is envisaged to start generating electricity later this year, if all goes to plan.

Already up and running is a 225 MW Karpowership, moored at Tema Harbour, which has been dispatched year as backup generating capacity since early 2016. Shipment of an additional 450 MW Karpowership, from Turkey to Ghana, is set to bring Ghana's mobile gas power capacity up to 675 MW.

Another IPP that counts on LNG imports is the Ghana-1000 venture backed by GE, Endeavor Energy and Finagestion. Project partners seek to build a dedicated FRSU to guarantee gas supply to a 1,000 MW power plant that will be realised in stages. Phase-1 involves construction of a 360 MW open-cycle unit that is due to start up this spring. Once operational, this unit will be converted to combined-cycle mode to produce 540 MW by early 2018.

Slowdown on upstream efforts

Importing LNG via flexible FSRUs is meant as a short term solution to bridge the time until Ghana manages to tap more of its domestic gas resources. The Government in Accra has put the development of domestic gas upstream assets on the back burner at times of low global oil prices. Volumes delivered through West African Gas Pipeline are patchy, at best, as quarrels continue among contract partners over payment of gas deliveries. Illegal fuel siphoning and a lack of domestic gas and power networks do not make matters any easier.

On the bright side, some associated gas is being produced from Ghana's Jubilee Field following an aggressive exploration campaign. Non-associated gas in significant quantities is expected to come from the Sankofa Field. Ghana Gas, the national gas operator, had published an upbeat 3-year forecast about the ramp-up of domestic gas production; the Sankofa-Gye Nyame (SGN) project was meant deliver 180 million cubic feet per day (MMcf/d) to underpin 1 GW of power gen capacity from early 2018; a further 60 MMcf/d should come at some point in time from the Tweneboa, Enyenra and Ntomme (TEN) project.

High costs for upstream project and operational delays have, however, turned the Government's focus on importing LNG in the short term. Spot LNG is seen as a way out for Ghana to avert its domestic supply shortages; and the West African nation is not the only county in the region that is actively pursuing this option. In fact, analysts at BMI Research anticipate that sub-Saharan Africa will become a "niche market for LNG" which will be mostly used for decentralised power generation.

Hydro power – once Ghana's mainstay energy source – has dwindled. Water levels at the Akosombo hydro facility are low and are anticipated to "take years to replenish." LNG-fuelled power plants consequentially are deemed critical to avert a power crisis that would undermine the Ghana's economic development.

Options for flexible powergen

Technically speaking, there are two options to swiftly solve Ghana's energy hunger: Power barges versus FSRU combined with onshore power generation.

Power barges are moored offshore near the centres of energy demand, which in developing countries are mostly the urban centres. Offshore generation has an inherent flexibility: The power barge can simply be disconnected and moved to a different location in the event of a sudden drop in demand, unforeseen quarrels over payment, or adverse changes in policies and regulation. Shorter lead times and lower upfront costs are other clear advantages of power barges over importing gas via a FSRU for onshore power generation.

Financing remains a major stumbling block for large infrastructure projects in Africa. Upfront expenditure tends to be higher for land-based industrial-scale power plants, compared with offshore power barges. Yet investors are generally more cautious when spending money in sub-Saharan Africa due to political risk, contractual risk and operational delay – which causes further delays in a vicious cycle which ultimately allows just a few projects to reach FID. ■

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Norwegian and/or EU to meet demand" Bros argues and according to this definition, in 2015 a staggering 42% of UK demand was 'foreign' gas.

Until now, Ireland has been getting 97% of its gas from the UK. In the internal market this was labelled EU gas, but post-Brexit, this same gas will be labelled 'foreign' gas and with no re-gasification capacity, all Irish 'foreign' gas will either have to be sourced from the UK or be transited via the UK.

Underlining the importance of Irish security of supply during Brexit talk, Bros suggested this fact "could be used by the UK to try to preserve the status quo as this is the cheapest way to provide security of supply to Irish consumers."

"UK needs to reshape its energy diplomacy"

To escape this conundrum, the OIES paper advises the British government to reshape its energy policy and revisit the terms of gas supply contracts with the EU and Norway. In sharp focus are now also the export/import dynamics on gas interconnections between the UK and the Continent.

Post-Brexit, the UK will make up its gas shortfall by importing Norwegian gas but also EU-26 gas, a mixture of domestic and imported gas. Essentially this will mean "the EU-26 would be slightly more dependent on foreign gas than the former EU-28 but both the UK and Ireland would be much worse off."

"The NBP-TTF spread will have to increase for EU gas to move to and from the UK," Bros forecast while on the other hand, "some countries in Europe could be tempted to impose severe and costly regulation on EU-UK pipelines to push up energy prices in the UK allowing de facto the EU to be slightly more competitive."■

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US spot cargo to reach India in mid-April

Gail India, the state-run gas supplier, has bought a second shipment of LNG from Cheniere Energy that has set sail from Sabine Pass in Louisiana and is due to reach India by the middle of April. The spot cargo is heading for the Dabhol regasification termial on India's western coast.

The deal between Cheniere and Gail makes India the first Asian importer of US shale gas. India in 2016 overtook South Korea as the world's second-largest LNG importer on a short-term and spot basis.

Buyers in Asia have been seeking to benefit from the slump in global oil and gas prices which also spurred a rise in spot trading activity and the urge of creating a trading hub either in Singapore, Japan or China (Singapore).

Analysts anticipate a flurry of US shipments to India from Cheniere-operated terminals at the US Gulf Coast over the coming month. There is terminal capacity in India, so price is all that matters. If landed LNG can compete with alternative fuels, e.g. coal, for use in power generation – then there is a vast market for it in India, notably because the country suffers frequent electricity shortages and blackouts.

Delivered price of US LNG to India is reportedly about $5/mmBtu – yet this is higher than the $4.30/mmBtu now paid by customers in northeast Asia for spot cargoes, according to assessments by the World Gas Intelligence publication. Prices crashed 78 percent from the peak in February 2014. ■

GAIL's Dabhol LNG terminal is about to receive a 2nd US cargo

Canada's 1st LNG to be exported via Louisiana

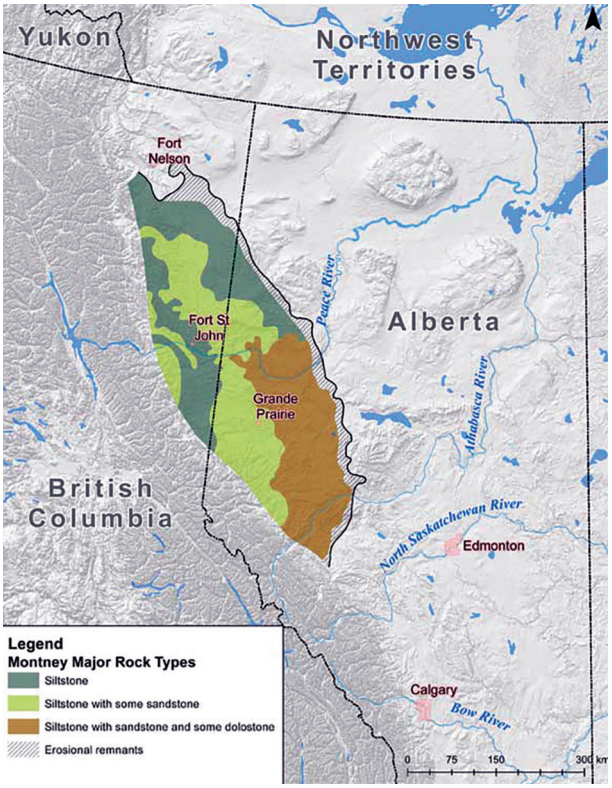
Canada's first export of LNG is understood to be soon heading overseas from a port in Louisiana. Cheniere Energy is considering the liquefaction and export of natural gas sources as far off as the Montney shale play, straddling Canada's Alberta and British Columbia provinces.

The deal, reported by Bloomberg, underscores the great efforts Canada's gas explorers have to make to get their fuel to market.

Upstream ventures in Canada are almost crushed by the aggressive competition from US shale oil and gas wildcatters. Costs and time-to-market seem less favorable for projects north of the US/Canadian border.

While several LNG export terminals have been proposed in British Columbia, observers believe it will take years before any are up and running – if at all. No Canadian gas has ever been exported as LNG, so taking the fuel from Montney shale play all the way to Louisiana for liquefaction and export seems quite innovative and may not be without challenges.

The frontrunner Cheniere Energy is now taking advantage of its strong position at a time when gas imports are declining due to the US shale gas boom. Prices for Canadian gas exports need to compete with the cheap and abundant domestic gas supply in the United States. ■



Map of Montney Formation.
source: National Energy Board (NEB) Canada

Rio Grande LNG gears up for stock market listing

Next Decade is following the trend of US Gulf Coast liquefaction projects to get their project companies listed on the stock exchange. Kathleen Eisbrenner's NextDecade has signed a letter of intent for a business combination transaction that will allow the privately-held company to become a publicly-listed company. To that end, Eisbrenner is using the services of Harmony Merger Corp.

The listing is meant to ease the fund-raising process for Next Decade's 27 mpta Rio Grande LNG project that is currently advancing through the FERC permitting process. Tellurian Inc., meanwhile, recently completed a reverse takeover of a small oil and gas exploration firm to gain a Nasdaq-listing that is meant to boost the prospects for Driftwood LNG.

Driftwood LNG aims to raise $200m in Nasdaq listing

Preparing a first share offering, Tellurian in mid-March issued a prospectus proposing to sell shares valued up to $200 million on the Nasdaq Capital Markets stock exchange.

Tellurian Inc., developer of the Driftwood LNG project in Louisiana, recently chose SG Americas Securities to provide a financial strategy for the venture. SG Americas is the US broker-dealer subsidiary of France's Societe Generale.

Charif Souki, Tellurian founder and ex-Cheniere Energy chairman, completed a reverse takeover in February 2017 to get Tellurian listed in a move to efforts of ease fund-raising. Meg Gentle, president and CEO, said that with SG's expertise at hand, financial structuring of Driftwood LNG would advance swiftly, hence "we anticipate construction in 2018 and first LNG from Driftwood in 2022." ■

Bill urges to US-flag ships for 30% of LNG exports

A bipartisan bill, launched by US Congressman John Garamendi (D – CA), calls for up to 30 percent of exports for liquefied natural gas and crude oil to be transported on ships that are flagged under the law of the United States.

"The state of the American maritime industry is in crisis-level decline," said Garamendi. "After World War II, our oceangoing fleet of U.S.-flagged ships numbered 1,200. Today, it's fewer than 80. This isn't just an economic concern — it's also a national security risk."

He strictly opposes reliance on foreign-flagged vessels to move what he calls "strategic materials" (oil and gas).

Introducing a requirement for "even a minority of strategic energy asset exports to be carried on U.S.-flagged ships will," in Garamedi's view "compel us to rebuild the technical skill to man these vessels—and with that comes good, high-paying, maritime jobs."

Unsurprisingly, this legislation has strong support from the US maritime industry:

Marshall Ainley, President of the Marine Engineers Beneficial Association, said the proposed legislation would revitalize the maritime industry by creating thousands of seafaring jobs. The MEBA appreciates Rep. Garamendi's effort to apply "Make it in America" standards to the maritime industry."

The Transportation Institute, meanwhile, said in a statement it fully supports this legislation because it is expected to strengthen the US merchant marine by creating jobs and "ensuring that this dangerous cargo is carried aboard our fleet by our skilled mariner workforce." ■

CB&I 'optimistic' for growth

Philip K. Asherman, President and CEO of US engineering and construction company Chicago Bridge and Iron (CB&I) said he was "optimistic" that stability in commodity prices and major capital programs, particularly in North America and the Middle East, "will result in resumption of substantial backlog growth by mid-year of 2017."

CB&I posted an operating loss of $665.6 million last year but Asherman stressed that all proceeds from the divestiture of the company's Capital Services business will be spent to reduce debt to optimize the balance sheet. The firms Engineering& Construction (E&C) backlog was $9.9 billion in December 2016 versus $12.8 billion at the end of the previous year.

First gas for Kosmos-BP FLNG Train 1 eyed in 2021

Kosmos Energy is drilling an exploration well with total discovered resource of 25 Tcf of feed-gas. The US firm cooperates with BP on plans to produce LNG floating hulls offshore Senegal and Mauritania; to that end it successfully drilled the Teranga-1 exploration well in 2016.

First gas from Kosmos-BP FLNG Train 1 is scheduled for 2021, the company said, and the start of FLNG Train 2 is set for 2023.

Sabine Pass Train 3&4 to come on-stream in 2017

Cheniere Energy, owner of the Sabine Pass liquefaction plant in Louisiana, the first US LNG export facility, said transition and execution will remain central themes for Cheniere in 2017.

"We expect Trains 3 and 4 at Sabine Pass to begin commercial operations, with Train 3 having produced its first commissioning cargo in January," Jack Fusco, Cheniere's President and CEO stated when presenting the company's annual report. Once all six Trains come on stream, Sabine Pass will have a have nameplate capacity of 27 mtpa. Corpus Christi LNG, Cheniere's second venture on the Texas Gulf Coast, is designed to produce an initial 13.5 mtpa, with Trains 1 and 2 expected "to reach substantial completion in 2019."

Company Briefs

Chart changes executive team

Cleveland-based Chart Industries Inc. is about to carry out a series of management changes as part of a wider succession plan that will also see its corporate headquarters move to existing Canton, Georgia facility from Garfield Heights, Ohio.

The new man at the helm will be William C. Johnson, currently President and COO – while Samuel F. Thomas, current chairman and CEO will be made executive chairman effective May 25, 2017, and then retire from the company in May 2018. Moreover, Chart's CFO Kenneth J. Webster will not relocate to the new headquarters in Canton and is about to leave the company; his role has been taken by Jillian C. Evanko who was appointed CFO effective March 1, 2017.

Commenting on the leadership change, the Sam Thomas said "now is the right time" for this move as it would allow an "effective transition". The CEO-elect explained that "as we are coming through a downturn and preparing the company for a significant lift in business, there is enormous benefit to be able to respond quickly and ramp up our capacity with a lift in orders"; having a new team in place is meant to help "accomplish that effectively."

KBR & Samsung undertake engineering for Texas LNG

Vivek Chandra and Langtry Meyer, co-founders of the Texas LNG Brownsville project have selected Samsung Engineering and KBR to provide a detailed engineering report – as the basis for deciding whether to take a final investment decision (FID).

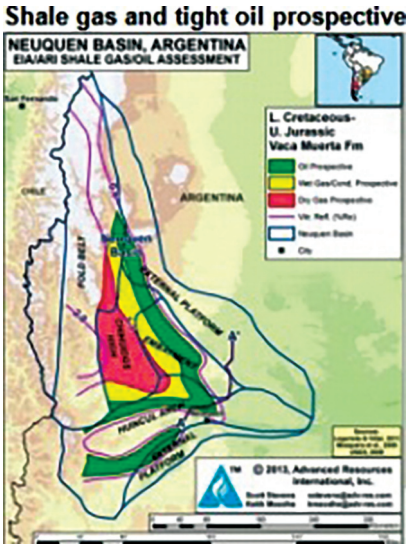
Samsung holds a minority equity stake in the Texas LNG project, which envisages a 4 mtpa liquefaction plant using the Air Products propane pre-cooled mixed refrigerant LNG processing system. The plant will be constructed on a 625-acre site on the north shore of the Brownville Port's deepwater ship channel.

Argentina's YPS brings Shell on board for shale gas pilot project

'Vaca Muerta', Spanish for 'Dead Cow', is the name of a pilot shale gas project in Argentina's Neuquen province that Shell agreed to develop together with the state energy company, Yacimientos Petroleiferos Fiscales (YPF). Once onstream the project could alter the LNG supply/demand balance in South America, limiting the potential of US LNG exports to the region.

With an estimated 308 trillion cubic feet (Tcf) of technically recoverable shale-gas resources, development of Argentina's Vaca Muerta formation is promoted by the Government as a step towards its to reducing gas import dependency.

By 2022, the Government in Buenos Aires aims to cease LNG imports as shale-gas supplies are meant to start flowing by that time.



As for geologic structures, the Vaca Muerta shale gas formation compares in terms of depth, thickness, pressure and mineral composition with the Eagle Ford play in Texas.

YPF, to date, is the lead operator in the Vaca Muerta play; but to fast-track development and tap technical expertise of global upstream companies, it has signed joint ventures with partners including Chevron and Dow Chemical, BP, Total and Petronas.

The latest Shell/YPF agreement envisages a pilot project in Bajada de Anelo area of Vaca Muerta Shale, which will be equally owned by the two project partners, the two companies stated when signing preliminary terms and agreements on the deal.

On project finance, Shell committed to invest an undisclosed sum in two phases of the shale-gas project.

The commercial deal between YPF and Shell was announced just weeks after Argentine President Mauricio Macri said that he had signed an overall agreement with oil majors aimed at boosting investment in the Vaca Muerta shale region.

President Macri said a total of $5 billion in investments had now been made to achieve sizable production from the Vaca Muerta. YPF itself said it intended to invest $2.3 billion in the Vaca Muerta shale fields during 2017, while Shell had pledged to spend $300 million each year until 2020 in Argentina for exploration, refining, distribution and marketing of oil and gas.

Once one of the largest natural gas exporters in South America, Argentina turned net importer in 2008 and imports currently account for over 20% of the county's consumption. Argentina sources its imported natural gas either from Bolivia via pipeline or as LNG from Trinidad and Tobago, the United States and the global spot market. ■

Shale gale continues, sending US gas price down

Reversing last year's slight drop, the production of US dry natural gas is seen average 73.7 billion cubic feet per day (Bcf/d) in 2017, a rise of 1.4 Bcf/d year-on-year (yoy), the Energy Information Administration (EIA) forecasts. The average Henry Hub spot price fell by $0.45/mmBtu during February to a level as low as $2.85/mmBtu.

"New natural gas export capabilities and growing domestic natural gas consumption contribute to the forecast Henry Hub natural gas spot price rising from an average of $3.03/mmBtu in 2017 to $3.45/mmBtu in 2018," analysts wrote in the EIA's latest Short-Term Energy Outlook (STEO).

NYMEX contract values for May 2017 delivery traded during a five-day period in early March, which according to EIA analysis "suggests that a range of $2.15/mmBtu to $3.82/mmBtu encompasses the market expectation for Henry Hub natural gas prices in May 2017 (at the 95% confidence level.)"

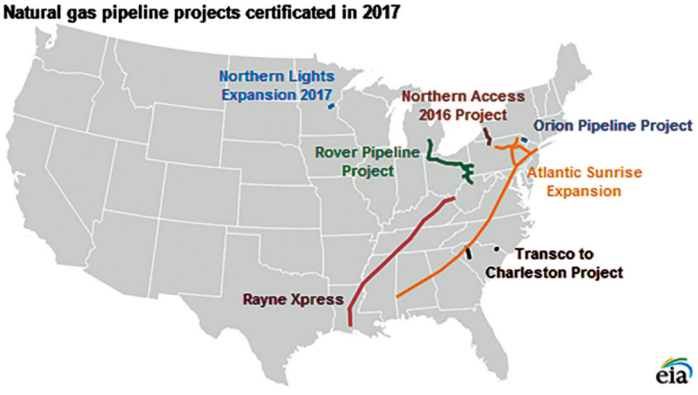
Traded US gas prices may fall further as shale gas production continues to increase. By 2018, natural gas production is forecast to rise by an average of 4.1 Bcf/d from the 2017 level.

New interstate pipelines from Marcellus, Utica Shale

As geography of US domestic gas production shifts, and production of unconventional gas at Marcellus and Utica Shale in the Northeast keeps growing, the Federal Energy Regulatory Commission (FERC) moved to certify an array of new interstate gas pipelines.

So far in 2017, FERC certificated more than 7 Bcf/d of new pipeline capacity before losing its quorum following the departure of one commissioner in February, which left just two sitting commissioners and three vacant seats. In the past year, FERC had certificated 17.6 Bcf/d of new natural gas pipeline capacity.

Key interstate gas pipelines include the $4.2 billion Rover Pipeline (and related projects) with a capacity of 3.3 Bcf/d as well as the $2.6 billion Atlantic Sunrise Pipeline which will add 1.7 Bcf/d of gas transport capacity. Rover Pipeline LLC said it plans to start construction in Q1-2017, while Transcontinental Gas Pipe Line Company, LLC, stated works on the Atlantic Sunrise Pipeline will begin this summer. ■



FERC gives nod for new interstate pipelines to better link Shale Gas Basins

Buyer's commitment issues derail projects

Reluctance of buyers to commit to sign firm offtake agreements with project developers due to the abundance of supply has inevitable consequences, with today over 80% of new-build capacity being deferred.

"The era of 20-year contracts is not over, because the old truths are still just that – suppliers cannot fund the massive investment required to build new LNG projects without long-term offtakers to provide the rates of return that our bankers and shareholders demand," according to Woodside Energy CEO Peter Coleman.

P. Coleman

In his view, buyer reluctance to commit to long-term contracts in recent years has been one of the major factors in developers deferring around $90 billion worth of liquefaction plant which would have added 93 mtpa to global capacity.

"We are not only facing a five-year period in which there will be an abundance of resources coming from the world's liquefaction facilities," he said, "but an abundance all the way across the LNG supply chain – almost a perfect storm – in the availability of shipping, in the flexibility of contracts and in the existence of cheap regasification capacity."

"Today, 50% of the market is being taken up by new buyers," Coleman said, stating about 26% of the LNG market, or 66 million tons, was traded under short-term contracts in 2015.

Market less flexible than commonly believed

Increasing spot trade in a period of oversupply and low prices means more new buyers are will emerge, creating competition from non-traditional buyers and risks for traditional buyers, particularly long-dated buyers, including Japan.

While the global gas markets are well supplied, the IEA warned that LNG markets were less flexible than is commonly believed.

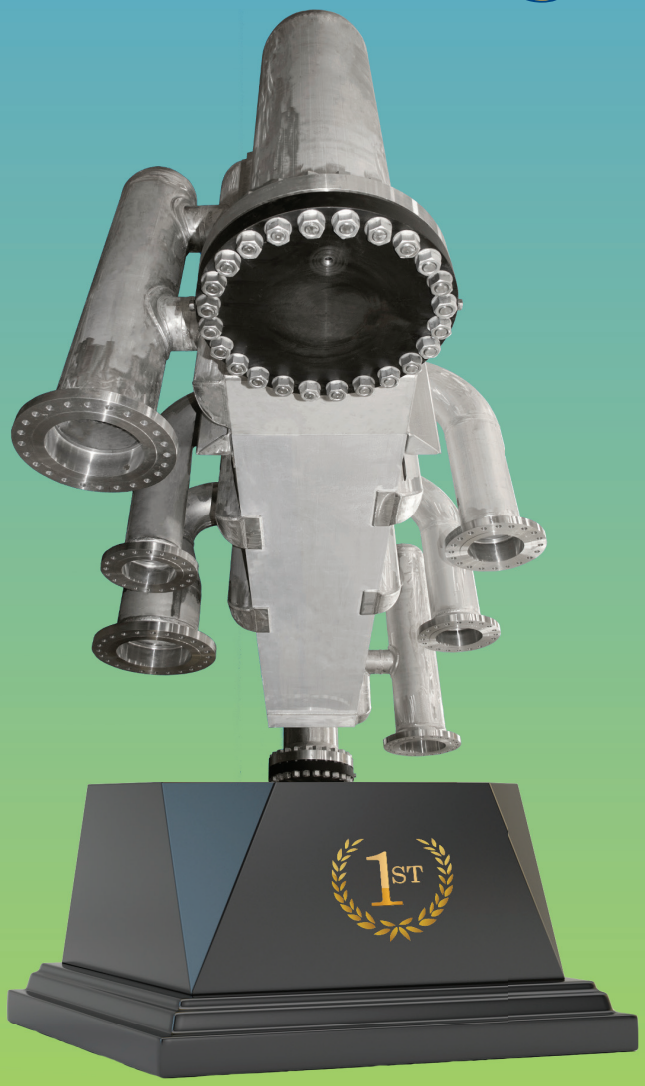
"A growing share of LNG capacity is offline, mostly because of a lack of enough gas to feed into the system but also because of security and technical problems, meaning the market has less extra capacity than assumed. Between 2011 and 2016, the level of unusable export capacity has doubled, disabling about 65 Bcm of gas, which is equal to the combined exports of Malaysia and Indonesia, the world's third-largest and fifth-largest exporters," analysts noted.

The IEA warned that the supply security architecture of an energy system should not be based on cyclical factors.

"Today's oversupply should not be regarded as a structural feature of the market and thus as an expression of the higher level of security that LNG markets can bring. On the contrary, it stems from a step change in the pace of global gas demand expansion that caught industry by surprise, and as such it highlights the challenges of accurately forecasting demand (and supply) in a rapidly evolving energy system," it said.

On destination clauses, the IEA said that in 2015 about 40% of LNG contracts had fixed destination terms, down from 60% for contracts signed up to 2014. While shorter term contracts are gradually becoming more common, buyers are also accepting longer contracts in exchange for increased flexibility in the final destination in order to better respond to market conditions. ■

Chart Brazed Aluminum Heat Exchangers



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SoCalGas embraces "new level of resourcefulness"

Grappling with opposing signals on gas supply security, the state of California and energy companies are starting to embrace a "new level of resourcefulness," says Callie Kolbe, analyst at Point Logic.

Though this winter had been slightly cooler and wetter than normal in California, this gave little respite from an energy procurement standpoint: Storage activity and inflowing supply to meet incremental demand changed substantially. The Aliso Canyon caused a "well-documented chaos", as Ms. Kolbe puts it, and TSO in both Northern and Southern California have learnt some lessons for the coming winters.

Aliso Canyon, operated by SoCalGas, is a huge storage gas storage facility that provides 86 billion cubic feet (Bcf) out of a total 135 Bcf of capacity in Southern California. In the aftermath of the gas storage leak, SoCalGas can only meet demand of about 4.5 Bcf/d instead of 5.2 Bcf/d, as envisaged in its '1-in-10 year design day planning criteria'.

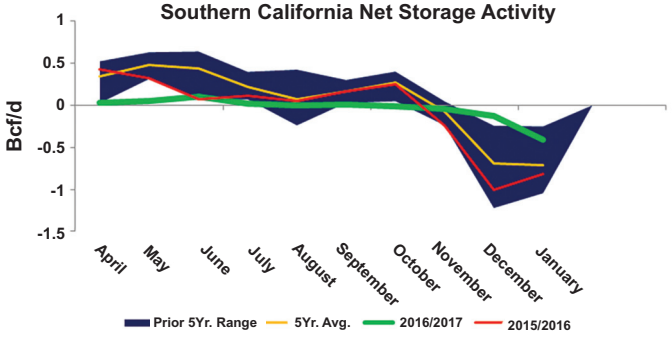
The northern half of California, by contrast, can draw from eight separate storage fields that provide natural gas to PG&E's service area. As the largest utility in the state, PG&E controls nearly 103 Bcf of capacity while another 138 Bcf are run by four independent storage operators.

North-South Divide

At the peak of 2016/17 winter demand, things panned out quite differently for grid operators in the Sunshine State – observers spoke of a divide in terms of the supply/demand balance between the northern and the southern part of California. PointLogic Energy tracked daily injection and withdrawal activity from storage and analysed related pipeline flows, e.g. gas imports to cover supply bottlenecks.

In northern California, combined reported withdrawal activity averaged 1.2 Bcf/d, a 0.7 Bcf/d increase year-on-year amid colder seasonal temperatures in the region. Storage inventories, as reported by PG&E, were at just over 66 Bcf at the start of February, a 14% drop compared to earlier years, mainly due to the fact that Northern California has not been able to rely as much on pipeline inflows this winter, e.g. flows were down 0.3 Bc/d compared with the five-year average on PG&E's California Gas Transmission Line.

Southern California, meanwhile, was left to source gas supply from neighboring regions.



Source: PointLogic Energy Flow Data

Ongoing issues at Aliso Canyon meant that the state's southern part started into the winter season at an inventory level and a daily net withdrawal rate that were significantly below prior years.

Squeezed on storage, the withdrawal rate fell 0.65 Bcf/d compared to the previous winter period and averaged at just 0.26 Bcf/d. SoCal figures show that storage inventories were roughly 44 Bcf at the start of February – well below the prior five-year average of 81 Bcf (see graph).

Net gas inflows from cross-border pipelines had been vital to meet SoCalGas' winter demand. PointLogic Energy's Flow Tracker illustrates that flows into southern California averaged just over 4 Bcf/d in December, which was nearly 0.5 Bcf/d higher than the prior five- year average. This trend continues with average flows around 4 Bcf/d, or roughly 0.6 Bcf/d higher, than prior years. Most of this observed uptick has been delivered to SoCal's system from El Paso Natural Gas Pipeline via the Ehrenberg interconnection La Paz County, Ariz.

Regional Price Spreads

Looking ahead as spring approaches, the expected softer demand levels throughout both 'NOCAL' and 'SOCAL' will ultimately place downward pressure on the state's pricing hubs. Within Northern California, Malin cash basis has traded at an average discount of $0.03/MMBtu in January and PointLogic anticipates this discount to will increase as withdrawal activity remains high amid historically low pipeline inflows.

"Southern California will likely remain in the opposite situation with weak storage withdrawals and strong net inflows," PointLogic forecasts. The need to source supply from outside the state has kept upward pressure on SoCal Border cash basis, which has traded at an average premium of $0.01/MMBtu through January.

Softer demand through February and March, however, alleviated some of the economic pressure on the SoCal Border hub and helped bring the cash basis down to what has been at times a "slight discount."

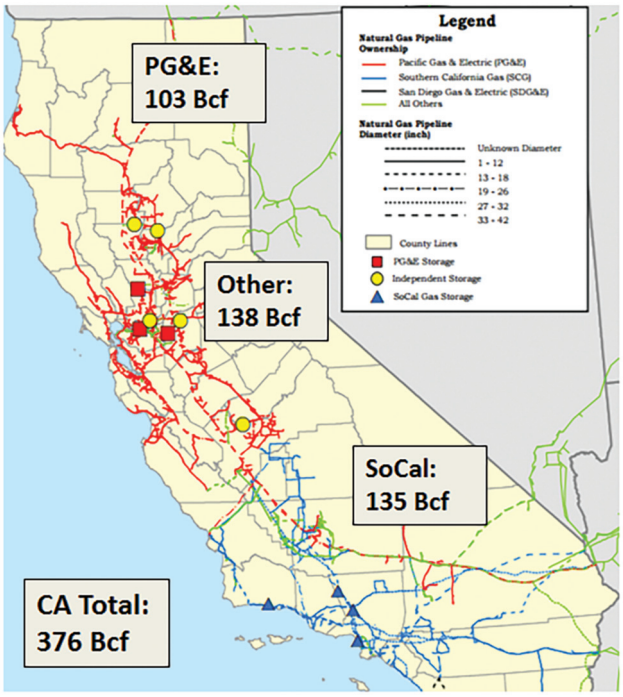
"However, due to the sub-region's limitations in drawing from storage, regional spreads with SoCal Border will likely stay tighter than usual," analysts concluded.

Bracing for Winter 2017/18

In early preparation for the coming winter, California's Public Utility Commission (CPUC) and the system operator CASIO have already agreed contingency measures to cap gas-burn in the power sector. Propping up gas storage with spot LNG purchases is being evaluated as an emergency option.

Regasified LNG could be delivered into the SDGE system from Sempra's Costa Azul regas terminal in Mexico, using the Otay Mesa receipt point. Sempra, the operator of the 7.6 mtpa Costa Azul facility has expressed interest – the Energy Commission and CPUC are in talks to sort out issues raise over affiliate rules. ■

Total Working Gas Storage Capacity



Source: California Energy Commission, EIA

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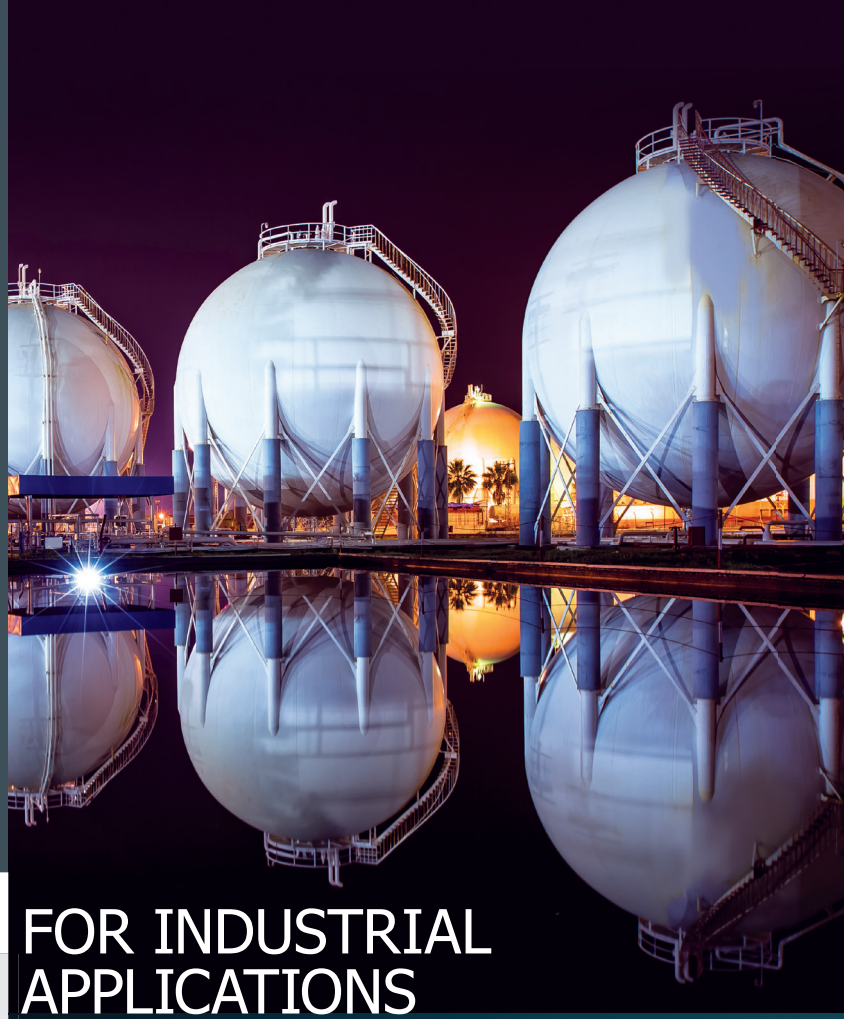

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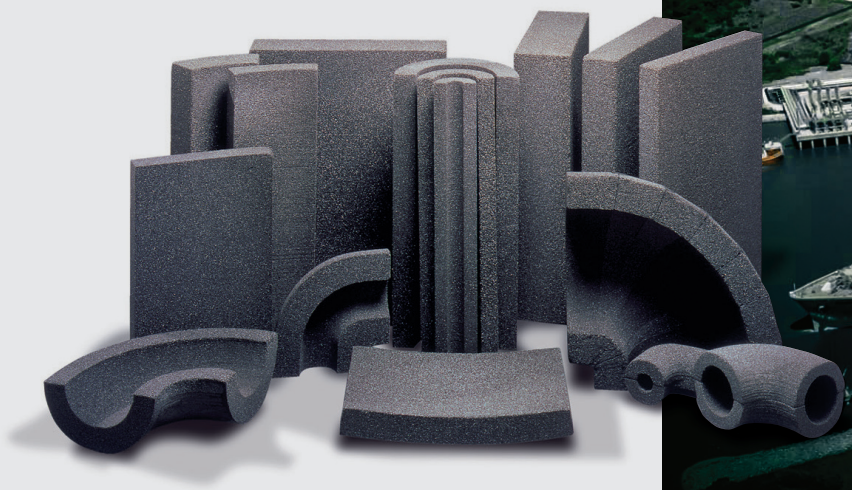

BP helps develop Alaska LNG's funding & tolling structures

British Petroleum (BP) agreed to collaborate with Alaska LNG project partners and set out terms for a tolling structure with a view to attract project financing. An accord to that end has been struck between BP and Alaska Gasline Development Corp. (AGDC), the state company now in charge of the Alaska LNG.

BP committed to contribute staff, resources, and assist AGDC with the selection of third-party contractors. The British oil and gas major has worldwide LNG interests and expertise through its stakes in production plants in countries such as Indonesia, Australia and Trinidad as well as projects offshore west and east Africa.

The deal was struck with the objective to tap use third-party infrastructure funding sources as a means to reduce costs, BP said, adding the accord would also help AGDC refine their understanding of tolling structures to identify a viable and competitive structure for Alaska.

To that end, BP now started to map out an 'agreement framework and phasing' as a prerequisite to execute and operate the liquefaction plant proposed for near Nikiski on the Kenai Peninsula. BP stated it agreed to "assist AGDC in developing the project on an expeditious timeline within AGDC's target in-service date of 2023-25".

Keith Meyer, President of AGDC said he welcomed BP's "continued support" in advancing Alaska LNG "As we turn our attention in 2017 to the areas of commercial, financial structuring, and regulatory, BP's input will be invaluable," he added.

AGDC in late 2016 reached a final agreement with BP, ExxonMobil and ConocoPhillips to take over technical and regulatory responsibility for the Alaska LNG project. Now, AGDC is in charge of all activities related to the proposed liquefaction facility and an 800-mile pipeline to access natural gas supplies via the North Slope. Under a pre-FEED joint venture accord, the four parties completed all of their initial commitments, including reports for the FERC environmental permit process for a plant to produce an initial 20 million tonnes of LNG. ■

Rendering of Alaska LNG

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