

U - Gas News Report

Unconventional Gas Activities in the World

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by Constancio Silva

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Sino Oil and Gas Holdings announced the commencement of sales of coalbed methane on a designated Sanjiao—Senze CBM pipeline from its Sanjiao block in Shanxi Province

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COALBED METHANE

EXPLORATION - DISCOVERIES

INDIA: Planned project – Tender - UG 75-1

India's state owned energy firm Oil and Natural Gas Corporation (ONGC) has received only **three bids for its four coal bed methane blocks**. A report in Business Standard newspaper says that the three parties are Great Eastern Energy Corporation (GEECL), Dart Energy and a consortium of Jindal Steel and Deep Industries. ONGC plans to farm out 35-45 % stake in each of the four CBM blocks - in Jharia and Bokaro in Jharkhand and North Karanpura and South Karanpura in Raniganj, West Bengal. Forced by the ministry of petroleum and natural gas last July, the company decided to cancel its earlier bid for farming out the blocks and invited fresh bids from international players, too, in November, the newspaper said. (January 13, 2013)

PRODUCTION

INDIA: Regulation - UG 75-2

Coal India Limited (CIL) has cautioned that there would be safety issues if the government allows other parties to harness coal-bed methane (CBM) in its leasehold areas. "We would like to explore it directly and a proposal has been sent to the Centre in July, requesting them to reconsider plans to offer CBM rights to others. A final decision is still pending with the government," Coal India chairman and managing director S Narsing Rao said on a board meeting. An estimated 20% of CBM reserves were in CIL's leasehold areas and there would be a threat if the government allowed others to harness the gas, Rao said. CIL cautioned that due to practical and safety issues, it did want any other player to operate in its leasehold areas. Rao said CIL only wanted extraction and collection rights for CBM and marketing would be done as per government policy. According to reports, the government was considering to offer CBM blocks on Coal India lease land without bidding, which might require Cabinet approval. Rao indicated that CIL would have a similar stand on shale gas, as third party exploration might lead to safety issues. But no concrete proposal has been sent to the government. According to the Directorate General of Hydrocarbons, India is estimated to have around 4.6 trillion cubic meter of CBM reserves. One TCF of natural gas is enough to generate about 100 billion kilowatt hours of electricity. India's CBM production is estimated to reach 4 million standard cubic meter per day (mmscmd) by 2016-17, as compared to the current level of 0.23 mmscmd in 2011-12. The total commercial production of CBM in the country in 2011-12 (up to February, 2012) was 74,833 mmscmd. Government has so far allocated 33 blocks to different companies, both PSUs and private sector, in four auctions. (December 12, 2012)

ASIA: Reserves - UG 75-3

The new report from business intelligence experts Global Data looks at Coal Bed Methane (CBM) which is extracted from coal seams and represents an important unconventional source of gas. **Asia-Pacific is a major natural gas market**, with the potential to become the largest gas market in the world in the future. The existence of **substantial coal reserves**, particularly in Australia, China and India, **provides opportunities for companies to undertake CBM exploration and development activities**. The region holds 265,843 Million Tons (mmt) of proven (1P) coal reserves as of 2011, leading the region to rank second after North America in global reserves. Some of the most highly industrialized countries in the world are located in this region, such as Japan, South Korea and China, along with some of the most highly populated countries with high consumption rates, such as India and China. This incredible growth of natural gas consumption across Asia has made the development of unconventional gas sources vital to the region's economy. Australia has already had major success in CBM developments, but China is now also aggressively developing its CBM resources, while other Asian countries such as India, Indonesia and Vietnam begin to seek out similar opportunities. The urgent need to develop CBM as a secure gas source is being **supported by favourable fiscal policies and government regulations** in a number of Asian countries. Queensland in Australia has introduced a gas scheme which mandates the increased usage of natural gas for power generation, and China has provided CBM operators exemption from Value Added Tax (VAT), and exemption from import duty for machinery used for CBM extraction. India has also announced a tax holiday for CBM operations, albeit only for the blocks offered in the last four CBM exploration blocks award rounds. (January 5, 2013)

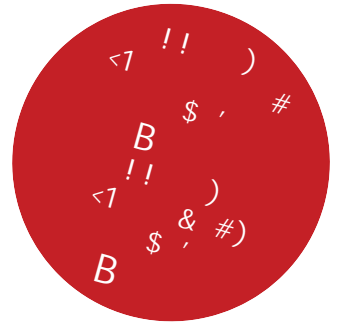


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UK: Planned project – Production forecast - UG 75-4

Coal-bed methane specialist Dart Energy International reported recently that a **three-month production test of its Airth 12 well in Scotland has been successfully completed**. The well which was completed in March 2012 and brought online in June was operated continuously for three months on a controlled production test basis. Sustained flow rates in excess of 500,000 standard cubic feet of gas per day were achieved, with peak rates in excess of 800,000 cubic feet per day. Dart said the well was held back from its maximum potential to minimize gas flaring. Declaring the production test as a success Dart is now curtailing gas production at Airth 12 in order to preserve the gas for ultimate commercial production, although it will flow some gas for on-site electricity generation. Dart is now awaiting regulatory approval before it can carry out further field development at Airth. The firm already has a gas sales agreement in place with SSE, the UK's second-largest utility. (January 21, 2013)

SUPPLIES – IMPORTS – EXPORTS

CHINA: Planned project – Start up - UG 75-5

Sino Oil and Gas Holdings announced the commencement of sales of coalbed methane on a designated Sanjiao-Senze CBM pipeline from its Sanjiao block in Shanxi Province. The Sanjiao project is jointly developed by Orion Energy International, the Group's wholly-owned subsidiary, and its PRC partner, China National Petroleum Corporation. The pipeline was built and funded by a private enterprise in Shanxi Province to support the gas consumption requirements of Senze Coal & Aluminum Group. Anticipating a strong demand from this client, the pipeline has an annual design gas delivery capacity of 350 million cubic meters. The realization of sales on pipelines signifies a major milestone in the progress of the Sanjiao CBM project. CBM sales of which is increasing by leaps and bounds this year as the construction of pipelines approaches completion. The project is expected to enter a new stage. (January 22, 2013)

SHALE GAS

EXPLORATION - DISCOVERIES

ARGENTINA: Planned project - Agreement - UG 75-6

YPF has signed a preliminary agreement with Bidas Corp. for the of Argentina's vast nonconventional oil and gas resources, YPF said recently. The company said it will require an initial investment of \$1.5 billion over two years for the development of 663 square kilometers of the **Vaca Muerta** formation discovered in Neuquen province in 2010. YPF will hand over 50 percent of its rights to Bidas for the Bandurria and the Bajada de Anelo fields and both energy companies will share exploration and exploitation costs as well as technology and know-how. Most of the development will involve shale, but YPF said there are also plans for the exploitation of "wet gas," or natural gas rich in associated liquids, at Bajada de Anelo. The pilot project includes the drilling of 130 wells. Bidas, an Argentine company half owned by China National Offshore Oil Corp., will also lend \$500 million to YPF for the development of the shale fields. (December 28, 2012)

BRAZIL: Reserves estimates - UG 75-7

Brazil could offer exploration blocks that contain deposits of shale gas in as many as five separate basins in an auction planned for December, preliminary studies by the national oil agency (ANP) showed. Environmental and legal risks in Brazil may still preclude a boom in shale gas production like that seen in the United States over the past half decade, however. Olavo Colela, an ANP board spokesman, said the government wants to start developing natural gas from shale, also known as unconventional gas deposits, and include such blocks in an exploration auction forecast for December. Initial studies by the ANP show that the greatest potential for shale gas deposits in Brazil are located in the Parecis Basin in Mato Grosso state,

the Parnaíba in Maranhão and Piauí states, the Recôncavo in Bahia state, Paraná in Paraná and Mato Grosso do Sul states and the São Francisco Basin in Minas Gerais and Bahia states. Basins with potential shale gas in the Amazon and off the coast will not be included in the auction, Colela said. Tight oil and shale gas production is almost nonexistent in Brazil. The only project of this type was done by the state-run oil company Petrobras in the state of Paraná, where it produces small quantities of oil through fracking.

Exploration companies interested in these shale deposits will first need to get approval from the local environmental agency Ibama, which has been notoriously slow and bureaucratic. Companies could also face massive lawsuits if any environmental damage is suspected.

Brazil currently has natural gas reserves estimated at 32 trillion cubic feet. Director General of the ANP Magda Chambriard said recently that **estimates of the shale deposits in the above-mentioned basins indicate potential reserves of up to 500 trillion cubic feet.** Colela said environmental considerations would be paramount. "The contamination of the aquifers is closer to people's lives. It reaches household faucets," he said. (January 16, 2013)

CHINA: Partnership - UG 75-8

PetroChina is buying a stake in a big Canadian shale gas field for \$2.2bn, highlighting **Chinese energy companies' growing interest in Canadian resources** after the \$18bn Cnooc-Nexen deal, CNN reports. **PetroChina will form a joint venture with Encana** of Canada that gives the Chinese company a 49.9% stake in Encana's Duvernay lands project in Alberta, an area that contains shale oil and shale gas. It is the second big overseas deal by PetroChina in January, following its \$1.6bn investment in the Browse natural gas project in Western Australia. The Canadian approval sent a reassuring signal to investors about the country's openness to foreign takeovers. However, Stephen Harper, Canada's prime minister, also set out a new policy on acquisitions by foreign state-controlled companies such as PetroChina and Cnooc, which puts new obstacles in the path of such deals, and bans them altogether in the oil sands of western Canada. The Nexen takeover should not be seen as "the beginning of a trend, but rather the end of a trend", Harper said.

(December 15, 2012)

CHINA: Planned project – Tender - UG 75-9

China has granted shale gas exploration rights to 16 companies in a second round of auctions, as the country tries to find out more energy reserves to meet its rising needs. China's Ministry of Land and Resources said that the companies will invest 12.8bn yuan (\$2bn) to search and develop 19 shale gas areas allotted to them. The companies comprise of 14 state-owned firms and two private companies, and are part of a larger group of 57 companies that were given rights to explore shale gas blocks in October. The first round of auctions for exploratory rights for four shale gas blocks was held in June 2011. The ministry has allotted 26 blocks for exploration so far. (January 22, 2013)

GERMANY: Regulation - UG 75-10

The German Parliament has decided to **allow shale gas extraction by fracking** to continue. The vote in Berlin, on the same day that the British government said it would allow hydraulic fracturing to resume under strict environmental controls, was won 309 against 259, with two abstentions. Germany's Green Party had move a motion banning fracking, saying it would harm the environment. Fracking has actually taken place in Germany in small instances over the past 60 years, but was suspended recently on health and safety concerns. "We need the technology and we need natural gas as a resource won domestically," Andreas Laemmel of the ruling Christian Democratic Union said in parliament in Berlin. He noted that the government has commissioned studies on fracking to further evaluate the method and will adopt regulation if necessary. Companies including Exxon Mobil Corp have drilled test wells into unconventional natural gas reservoirs in Germany in an attempt to emulate the US shale-gas boom, Bloomberg says. (December 17th, 2012)

IRELAND: Regulation - UG 75-11

The recent launch of a **public consultation on shale gas and hydraulic fracturing by the European Commission asks Irish citizens to make "full, detailed and targeted submissions"**, in respect of the matter. Local MEP, Marian Harkin (Ind), said that the move by the Commission was "the right thing

to do” and pointed to the fact that greater powers of enforcement were required at national and European level for “all shale gas activities, including hydraulic fracturing”. “This consultation is likely to identify significant gaps in EU legislation - such as the need for a Mining Directive, the necessity to expand the remit of the Environmental Impact Directive and gaps in the Water Framework Directive,” she added. “It is strictly up to each member state to legislate for fracking and this Europe-wide consultation affords Irish citizens a chance to input into highly influential EU guidelines, expected to be published in 2014.” (January 20, 2013)

LITHUANIA: Planned project – Tender - UG 75-12

Chevron is expected to win a licence to explore for shale gas and oil in Lithuania after submitting the only application for a permit, according to reports. The exploration contract would give Chevron seven years to explore for unconventional reserves in the 1800-square-kilometre Silute-Taurage field in Lithuania. Chevron would also have 10 years to explore for conventional oil deposits in the field. State Geological Survey head Juozas Mockevicius told Reuters that Chevron was the only participant in the tender, which closed this week. The permit will require Chevron to invest at least \$31 million in the exploration project. A study by the US Energy Information Administration has put Lithuania’s potential recoverable shale-gas reserves at 113 billion cubic metres. According to Mockevicius, the prospect of finding shale oil in Lithuania is more likely than finding shale gas, Reuters reported. Lithuania joins eastern European neighbours like Poland and Romania - where Chevron also has operations - in the search for shale reserves. (January 18, 2013)

UK: Planned project – Drilling - UG 75-13

Cuadrilla Resources, the first company to mine for shale gas in Britain, has announced it will seek planning **permission for hydraulic fracture and flow test** of its well site near the coastal village of Banks. The company has already drilled a vertical well at the site, and wishes to advance the exploration programme, it said. Before Cuadrilla submits the planning application to Lancashire County Council, the company said it would like to give local residents an opportunity to find out more about what is involved in hydraulic fracturing. As part of this, Cuadrilla is holding a public information. Members of senior management will be on hand to talk with residents on a one-to-one basis. Francis Egan, Cuadrilla’s chief executive, said: “Hydraulic fracturing is a key part of the ongoing exploratory process of determining how much shale gas we can viably recover. It is important that residents feel well informed about our operations and our Public Information Day gives the opportunity for them to talk to us about our work. We are committed to engagement with, and being part of, the communities we work in whilst maintaining the highest environmental standards.” (January 21st, 2013)

UK: Regulation - UG 75-14

The **British government gave the go-ahead recently for exploratory hydraulic fracturing**, or fracking, to extract natural gas from shale-rock deposits. Because of the environmental concerns , the government called for stringent controls on fracking. But **the decision nonetheless potentially opens the door for a shale gas industry to begin developing in Western Europe**, even though many governments on the Continent remain wary. Poland has already allowed big energy firms to do exploratory drilling. With the British economy flagging, the government is under pressure from business to encourage use of natural gas in power generation alongside its large recent commitment to energy sources such as offshore wind and nuclear. Those sources are also lower emitters of carbon, but costly. Britain, where the government is relatively well disposed to shale gas, is viewed as something of a bellwether. If shale gas catches hold in Britain, and there are no major problems, its prospects on the Continent might look better as well. “We now see the U.K. as the front-runner in this story, along with Poland,” said analyst Menno Koch at Lambert Energy Advisory in London. But there is strong opposition to gas in Europe, particularly in Western Europe. Countries in Eastern Europe like Poland, Ukraine and Lithuania are more open to shale gas both to generate jobs and to ease their dependence on Russian gas. Chevron and Eni of Italy, among other companies, are in the early stages of exploratory drilling in Poland. Bulgaria, another East European country thought to have shale gas potential, has put a moratorium on exploration.

The British government is putting in place a system designed to shut down any fracturing operation before it can cause damage. It is also setting up an Office of Unconventional Gas and Oil, to monitor and potentially aid development of the new industry. (December 14, 2012)

UKRAINE: Planned project – Agreement – UG 75-15

Ukraine and Royal Dutch Shell have signed a \$US10 billion shale gas production sharing agreement aimed at helping the ex-Soviet nation ease its dependence on Russia. Yanukovich said the deal was "only the beginning" and vowed: "From now on we will also be able to find a flexible method of co-operation that will add value to both our countries' economies". The Ukrainian government estimates the eastern Donetsk location may hold **3 trillion cubic metres of natural gas -- enough to last the nation of 46 million people 70 years at current consumption rates**. Shell will sink 15 exploratory wells in the Yuzovska field in an area of 7,000 square kilometres, according to Ukraine's Natural Resources Minister Oleh Proskuryakov. Ukrainian Energy Minister Eduard Stavitsky said earlier Ukraine will be able to completely break its energy dependence on Russia should shale gas production proceed as envisioned under the deal. Proskuryakov estimated Ukraine could be producing several billion cubic metres of gas per year within 10 to 15 years, which could rise to 10 to 20 billion cubic metres per year. Stavitsky said Shell's pessimistic scenario foresees seven to eight billion cubic metres of gas per year, with the optimistic projection of 20 billion cubic metres per year. **The production sharing agreement is for 50 years**, according to a statement released by the Ukrainian unit of Shell. Shell will hold 50 per cent of the project and the other 50 per cent by the Nadra Yuzovska company, which is 90 per cent owned by the Ukrainian state. The remaining stake is owned by a small private firm that the Ukrainian media has linked to family members of Yanukovich. (January 25, 2013)

PRODUCTION

CHINA: Production forecast - UG 75-16

China will almost certainly fail to meet its target of producing 6.5 billion cubic meters of shale gas per year by 2015. Even so, there can be no doubt it is set to become one of the world's largest shale gas producers over the next decade. In its latest annual outlook, published recently, BP predicts China will be the most successful country outside North America in developing shale gas by 2030. Given the country's enormous shale resources and large prospective market, coupled with its ready availability of capital and proven engineering expertise, it is hard to argue with that assessment. Estimates vary but most analysts put China's technically recoverable shale resources at around 1,000 trillion cubic feet (tcf) (28 trillion cubic meters), which would make them the largest in the world, and about 20 percent higher than in the US (862 tcf). (January 19, 2013)

INDIA: Partnership - UG 75-17

State owned Coal India is looking to venture into shale gas space in India and has tied up with the US-based Advance Resource International for exploration and identification of the potential shale deposits within the company's coal blocks. "A pilot project is already happening in this regard in the Gondwana basin of Bharat Coking Coal Ltd (BCCL) and studies are going on in some parts of Central Coalfields Ltd. The results are expected to be out by the mid of this year, possibly by September," Business Standard quoted a top official of Central Mine Planning and Design Institute (CMPDI) as saying. Through this, Coal India is likely to become the second firm to succeed on shale in India, after ONGC's success in its pilot project at Ichhapur in Burdwan district of West Bengal. (January 17, 2013)

UNITED STATES: Ongoing project - Production - UG 75-18

It's well establish that the boom of natural gas in the US has led to increased demand for things used for production - more rigs, more trucks, more workers, more proppants. Proppants are the particles used in hydraulic fracturing to hold open tiny underground fissures caused by fracturing, allowing gas or liquids to escape and be recovered. **Sand, the most widely used and often cheapest proppant,**

saw its demand begin to skyrocket a few years ago, and now things have come full circle: more gas is needed to produce more sand in order to keep producing more gas and oil. According to a January report from Bentek Energy, a unit of Platts, WE Energies, a primary utility provider in Wisconsin, is considering building a new \$150 million pipeline in the western part of the state in part because of more gas demand for industrial silica (aka frack sand) production. Wisconsin, Illinois, Minnesota and Michigan are among the top producing states for sand in the US. In September 2012, US Silica (the second-largest producer of industrial sand and gravel in the US, according to the US Geological Survey) and other sand mining operators launched the Wisconsin Industrial Sand Association. US Silica is developing a new facility in Sparta, Wisconsin, which is slated to open in the second quarter of 2013 with a capacity of 800,000 tons annually. And in October, the company announced an agreement with SH Bell Company to open a new sand storage facility to support demand from energy producers in the Utica and Marcellus shales. (January 18, 2013)

CONSUMPTION

JAPAN: Investment opportunities - UG 75-19

Japanese chemical makers are striving to take advantage of the shale gas revolution in the United States to cut production costs. Domestic firms are racing to catch up with overseas rivals by stepping up efforts to develop technologies for utilizing the low-priced gas and increasing production of chemical materials in the United States, industry officials said. Industry leader Mitsubishi Chemical Holdings Corp. is expected to form a tie-up with a foreign chemical maker based on the use of shale

gas. Dow Chemical Co. has been tipped as a potential partner. Mitsubishi Chemical hopes to use U.S. shale gas to produce resin for automobile parts and liquid crystal display panels. Kuraray Co. plans to build a resin plant for adhesives and LCD panels in Texas, a key center for shale gas development in the United States, in September 2014. Mitsui Chemicals Inc. is also considering additional overseas investments. "A foreign company has invited us to join a shale gas project," President Toshikazu Tanaka said. Asahi Kasei Corp. has developed technologies to produce materials for synthetic fibers and resin from natural gas, an achievement that will make production costs far lower than those incurred when making the same materials from oil. The company is considering starting mass production of such materials from natural gas in the United States and Southeast Asia. U.S. and European players, such as Dow Chemical, have already made massive investments in shale gas projects, ahead of rivals in Japan. Japanese players are struggling with the yen's prolonged strength and rising electricity charges. Shale gas is key to the revival of Japan's raw materials industry, said Yoshimitsu Kobayashi, president of Mitsubishi Chemical. (January 18, 2013)

GENERAL INFORMATION

INDIA: Planned project – Tender UG 75-20

The cabinet is likely to discuss the shale gas policy, which favours **market-determined pricing** of the fuel, in the next two weeks. The **schedule for shale gas bidding includes finalisation of the fiscal policy, identification of the gas blocks for auction, road shows and the first round of auction** before the end of the calendar year. The government has identified six basins-Cambay, Assam-Arakan, Gondawana, KG onshore, Cauvery onshore and the Indo-Gangatic basins - for carving out blocks to tap the unconventional fuel. The draft policy favours market-determined pricing of shale gas. The policy will mention the terms of exploration and production to highlight the risks involved. The draft policy does not permit cost recovery and profit sharing - the two features that came under the criticism of the Comptroller and Auditor General of India during its audit of Reliance Industries' KG-D6 block. Bidders will be asked to quote a percentage of output they are willing to share with the government at different production slabs.

Demand for natural gas in India is expected to increase significantly from 179 million metric standard cubic metre per day (mmscmd) during 2010-11 to 473 mmscmd in 2016-17. Studies have put recoverable reserves of shale gas between 6 trillion cubic feet and 63 trillion cubic feet. (January 20, 2013)

POLAND: Regulation – Economic incentives - UG 75-21

Poland will likely **adopt a much-awaited law to regulate shale gas production** this year, opening the way for the potentially lucrative sector to kick into gear, Treasury Minister Mikolaj Budzanowski said. Poland has been the most aggressive country in Europe in pursuing shale gas. International and

Polish companies are exploring for the gas in Poland but are waiting for the new law - which will **regulate taxes on production, terms for starting business and distribution of gas** - before they commit to a longer-term strategy. "Foreign companies are undoubtedly waiting for the final version of the law, which should be adopted this year and take effect in 2015," Budzanowski told The Associated Press recently. "It will certainly give a big impulse for intensifying gas exploration efforts in Poland." A preliminary draft of the new law, which was demanded by the European Union, calls for a combination of taxes totaling about 40% on financial gains made by shale gas producers. But companies say it's the details in the new law that matter. Without its finalization, they cannot plan ahead. (January 12, 2013)

GAS HYDRATES

PRODUCTION

JAPAN: Production - UG 75-22

In the first experiment of its kind, Japan Oil, Gas and Metals National Corp. will begin a **test project aimed at producing methane gas from methane hydrate in the Pacific seabed** off Aichi Prefecture. The government-affiliated minerals explorer aims to launch commercial production as early as fiscal 2018, as Japan seeks to end its over dependency on overseas fuel shipments by developing a brand new energy source. Methane hydrate, a sherbet like substance consisting of methane gas trapped in ice below the seabed or permafrost, is viewed as a promising next-generation source of power. The project was commissioned by the Ministry of Economy, Trade and Industry. The corporation will charter a deep sea exploration vessel to carry equipment for the extraction of methane gas from methane hydrate in the seabed some 1.3 km off Aichi's Atsumi Peninsula. It plans to conduct the work for about two weeks in February and extract tens of thousands of cubic meters of gas a day. (January 12, 2013)

CEDIGAZ

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