



U-Gas News Report

Unconventional Gas Activities in the World

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COALBED METHANE

EXPLORATION - DISCOVERIES

INDIA: Regulation. — UG69-1

The **Indian government** is planning to make state-owned **Coal India Ltd. (CIL)** the **nodal company to commercially exploit the CBM** in areas where it has coal mining leases.

The move will allow CIL to extract methane before mining coal. The blocks operated by CIL will not be put up for global bidding for methane gas as is the case with the blocks

where CIL does not operate. Once the new policy is approved, CIL will offer the first set of five coal blocks with estimated CBM reserves of 30 billion cubic metres to companies for exploration simultaneously with its own coal mining operations. (June 17, 2012)

INDONESIA: Partnership. — UG69-2

CBM Asia Development Corp. announced recently that it has entered into a **Joint Study and Bid Group agreement with Continental Energy Corporation** to investigate coalbed methane exploration and development opportunities in Indonesia. Under the agreement, CBM Asia and Continental will jointly and exclusively study selected areas in Indonesia with the objective of identifying geologically favourable areas to be jointly pursued as targets of opportunity for direct acquisition of coalbed methane production sharing contracts offered by the Indonesian government. Successful CBM PSC acquisitions shall be shared by CBM Asia and Continental under a pre-agreed joint operating agreement with participating interest of 75% CBM Asia and 25% Continental. CBM Asia shall act as operator under the JOA and any CBM PSC and pay 100% of the JOA's CBM PSC general and administrative costs. (May 15, 2012)

PRODUCTION

CHINA: Planned project – Development plan. — UG69-3

Dart Energy is carrying out early commercialisation work on its **Liuling coal seam gas project** in China and expects to start **initial gas sales in the first half of 2013**. The company is currently working to bring 2 wells drilled in 2012 into production, bringing the total number of production wells up to 5. These are expected to provide enough gas to meet requirements of the existing gas sales agreement with Shaanxi-CUCBM for up to 1.75 million cubic feet per day. Dart is currently producing 500,000 cubic feet of gas per day from the first 3

multilateral horizontal wells at the project. Initial gas sales from Lulling will be carried out through a compressed natural gas plant that is currently under construction and expected to be ready for commissioning in the second half of 2012. Dart has already completed engineering design of a field gathering system and has an engineering procurement construction contract in place. Construction of the gathering system and associated equipment is expected to take between six to nine months. (June 14, 2012)

RESERVES

NEW ZEALAND: Resources estimates. — UG69-4

Solid Energy announced recently a more-than fourfold increase in its contingent resources of coal seam gas in the **Taranaki** after exploration results were assessed by Dallas-based Netherland, Sewell and Associates (NSAI). The coal miner has **858,000 million cubic feet of gas**, or about 900 petajoules. That's up from its June 2010 estimate of 190 petajoules. "Based on NSAI's

knowledge of similar field developments, the best estimate (2C) resources have a reasonable chance of being commercial,” said Stephen Pearce, Solid Energy’s general manager for gas developments. Solid Energy is seeking a five-year extension of its Taranaki permit to develop the project to the appraisal/discovery phase, he said. (June 19, 2012)

SHALE GAS

EXPLORATION - DISCOVERIES

ALGERIA: Regulation. — UG69-5

An adviser to the country’s energy minister said **Algeria will amend its hydrocarbons law** before the end of 2012 to attract more foreign investment to help it develop potentially big reserves of non-conventional resources.

“The amendments of Algeria’s hydrocarbon law will introduce tax incentives that aim to boost offshore exploration and attract foreign companies that can bring technology know-how for the **development of unconventional reserves**” adviser Ali Hached said. Production of shale gas could start within the next three years, Abdelhamid Zerguine, Sonatrach’s Chief Executive Officer said. Zerguine also said Algeria would remain the majority partner in all projects. A recent study showed that on an area of 180,000 square km and assuming a 20 percent extraction rate, production could reach 0.6 billion cubic metres per square km, Zerguine said. (May 3, 2012)

ARGENTINA: Resources estimates. — UG69-6

In Argentina, while experts in various branches of engineering and economics are enthusiastic over the prospects of the reserves discovered, they warn that the price paid to benefit from them could be steep. “There is indirect evidence of deposits in Argentina, but this will be determined with certainty when further exploration takes place,” economist Roberto Kozulj from the National University of Rio Negro said. **The shale gas formations are in four basins, but the Neuquén basin is the most promising.** This is where the Vaca Muerta and Los Molles formations are found, which stretch across the subsoil of

four provinces: Neuquén and Mendoza, in western Argentina, La Pampa in the center of the country, and Rio Negro in the center-south. The government of the province of Neuquén already has data on the region’s potential gathered through preliminary studies, said economist Ariel Carignano of the National University of Comahue in a report. The report states that, although there is a **“high degree of uncertainty,”** studies by the Undersecretariat of Mines and Hydrocarbons of Neuquén estimate that there are 170 TCF of recoverable gas in the Vaca Muerta formation and between 130 and 192 TCF in Los Molles. (May 20, 2012)

CANADA: Discovery. — UG69-7

Apache announced recently the discovery of a **new shale gas reservoir in British Columbia’s** under-explored Liard Basin. The company estimates that the discovery hosts enough natural gas to justify doubling the size of the Kitimat LNG terminal the company is currently proposing. Apache has described its new discovery as the highest-quality shale gas reservoir in North America. Tests suggest the play holds **48 trillion cubic feet of marketable gas** within its Liard Basin properties. The Liard Basin is located in Northeast BC, west of the Horn River basin. Most drilling activity is taking place in the central part of the basin, 110 kilometers northwest of Fort Nelson. The company has drilled three wells. To put the find into perspective for investors, the combined marketable gas portfolio of the Horn River Basin, one of the three largest shale gas basins in BC, is 78 Tcf; Apache’s find is almost two thirds that size. (June 19, 2012)

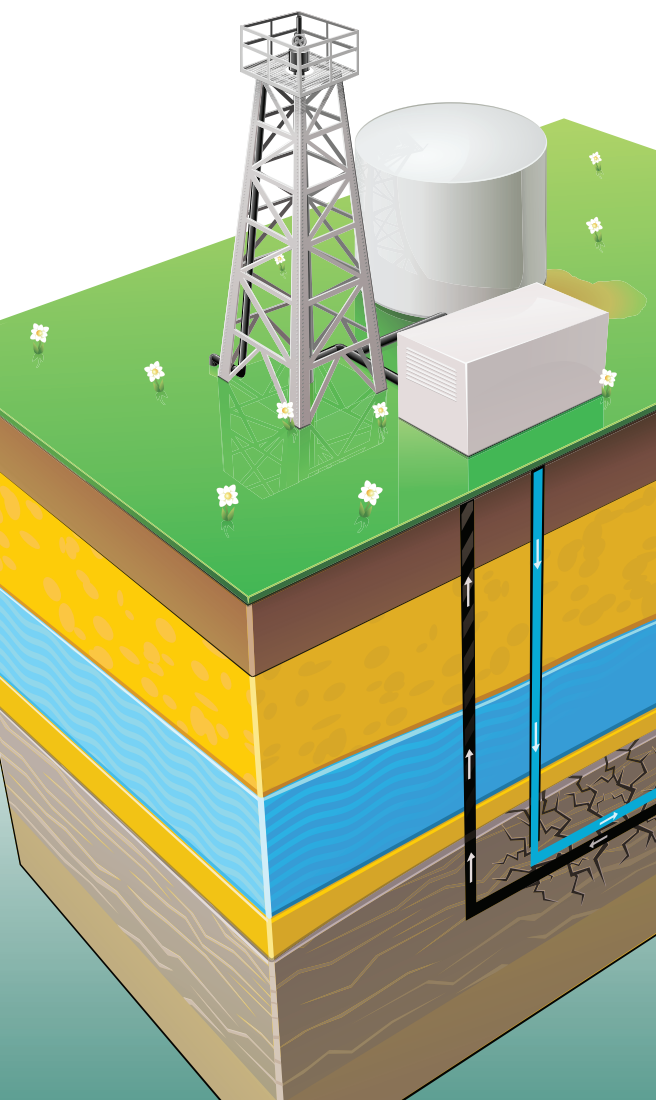


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Shale Gas Environmental Summit

29th and 30th October 2012, Copthorne Tara Hotel, London



KEY SPEAKERS INCLUDE:

- Alan Riley, Professor of Law, City Law School, City University
- Bernhard Cociancig, CEO International, MND a.s.
- Chris Shearlock, Sustainable Development Manager, the Co-operative Group
- Dr Andreas Hübner, Project Coordinator, Organic Geochemistry, GFZ German Research Centre for Geosciences
- Dr Ivan Scrase, Senior Climate Change Policy Officer, RSPB
- Dr James Allan, Principal Environmental Analyst, Maplecroft
- Dr Tim Fox, Head of Energy and Environment, Institution of Mechanical Engineers
- Grzegorz Pytel, Senior Policy Expert, Energy (Oil and Gas), Sobieski Institute
- James Lockhart-Smith, Head of Latin America, Maplecroft
- Jenny Banks, Energy and Climate Change Policy Officer, WWF-UK
- John Baldwin, Managing Director, CNG Services Ltd
- John Naylor, Technical Director, Ground-Gas Solutions
- Professor Kevin Taylor, Petroleum Geoscience and Basin Studies, University of Manchester
- Martin Diaper, Climate Change Advisor, Environment Agency
- Philippe Charlez, Non-Geosciences aspects of Shale Gas exploration, Total
- Prof. Dr. Friedbert Pflueger, Director, European Centre for Energy and Resource Security, King's College London
- Professor Dr Mariusz-Orion Jędrysek, Full Professor, University of Wrocław
- Professor Peter Styles, Professorial Research Fellow, Keele University
- R. Adam Kozłowski, Legal advisor, Of counsel, Norton Rose
- Professor Richard Davies, Professor and Director of Durham Energy Institute, Durham University
- Tom Leveridge, Senior Energy Campaigner, Campaign to Protect Rural England

PLUS TWO POST-CONFERENCE WORKSHOPS

31st October 2012, Copthorne Tara Hotel, London

A. Media Training

Presented by Paul Murrice, Managing Director, Media Mentor
8.30am – 1.00pm

B: Legal and Regulatory Specifics In Shale Gas Permitting, Exploration and Production in Europe

Presented by Kostadin Sirleshtov, Partner, CMS Cameron McKenna
8.30am – 1.00pm

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CHINA: Exploration partnership. — UG69-8

China National Petroleum Corp said recently that Italian **ENI** has sent representatives to evaluate a shale gas block onshore China. ENI sent a team to inspect and evaluate the Shunan area within the Xinan oil and gas block in central Sichuan province for shale potential. CNPC said added that both companies could potentially team up to evaluate and profile the acreage. ENI and CNPC signed a memorandum of understanding to promote joint projects in conventional and non conventional hydrocarbon plays in China and outside China in January 2011. ENI has said both agreements relate specifically to shale gas business opportunities. (June 19, 2012)

CZECH REPUBLIC: Regulation. — UG69-9

The **Czech Environment Ministry** is planning to put up to a **two-year moratorium on granting licences for shale gas exploration** until new legislation is put in place, the ministry said. During the moratorium, the ministry would look at preparing geological and mining legislation that is clear for potential exploration companies. "Existing Czech legislation is not prepared for such technically complicated research like there is in the case of shale gas," the ministry said. The ministry cancelled a provisional shale gas exploration licence for Australian-based BasGas in April 2012, saying a government commission made legal and procedural errors during the application process. (May 7, 2012)

POLAND: Exploration. — UG69-10

It has been recently reported that **Exxon Mobil Corp.** decided it will **not pursue shale gas exploration** in Poland. According to a local news report, Exxon said its test wells **did not produce commercial quantities of gas**. Exxon has six exploration licenses in Poland. However, a government report in March 2012 decreased Poland's estimated shale gas reserves from 768 billion cubic meters to 346 billion cubic meters. (June 18, 2012)

ROMANIA: Regulation. — UG69-11

Romania's **new government will seek a moratorium on shale gas drilling**. "An immediate moratorium will be placed on shale gas exploitation until European studies underway regarding the impact of hydraulic fracturing on the environment are finalized," the new governments economic reads. Companies including Chevron, Canada's Sterling Resources Ltd. and Hungary's MOL Nyrt plan to tap the reserves. Chevron has a concession on 600,000 hectares in the eastern Barlad area and three others in the southeast Dobroudja region, near the Bulgarian border. (May 4, 2012)

UKRAINE: Planned project - Exploration. — UG69-12

According to **Prime Minister of Ukraine Mykola Azarov**, the drilling of Ukraine's **first shale gas well will start in September 2012**. "Ukraine will produce its own shale gas. Maybe we will think over the shale oil production. It is quite an interesting and promising idea," Azarov said. Ukraine, recently announced awards for production sharing agreement to develop Yuzovska and Olessky gas fields. In May 2012, Chevron confirmed that it had won exclusive right to sign a production-sharing agreement for the Olessky field in the western Lviv region. Ukraine's state geological service reports said it holds **gas reserves of 0.8 to 1.5 trillion cubic metres**. Eni SpA was also bidding for the Olessky field. Royal Dutch Shell was reportedly awarded a production-sharing agreement in the Yuzovska concession, located in the eastern Donetsk and Kharkiv regions.

Exxon Mobil and TNK-BP were also reported to be bidders for Yuzovska, which estimated to hold reserves of 2 trillion cubic metres. (June 15, 2012)

UKRAINE: Exploration partnership. — UG69-13

Cadogan confirmed recently that, together with its joint venture partner **Ukrainian National Joint Stock Company Nak Nadra Ukrayny**, it has entered into a **Share Purchase Agreement with Eni**, whereby Eni has acquired a stake in the joint venture established by Nadra and Cadogan, Ukrainian company LLC Westgasinvest. LLC Westgasinvest currently holds subsoil rights to nine unconventional (shale) gas license areas in the Lviv Basin of Ukraine, totalling approximately 3,800 square kilometres of acreage.

Under the transaction, Eni will acquire 50.01% of LLC Westgasinvest from the joint venture parties and will fund an initial exploration program. Cadogan had already transferred ownership of its two west Ukraine licences, Debeslavetska and Cheremkhivska to the joint venture. The transaction remains conditional on achieving certain conditions precedent including Ukraine anti monopoly clearance over the next 90 days. (June 18, 2012)

PRODUCTION

INDIA: Regulation. — UG69-14

Directorate General of Hydrocarbons (DGH) and the Petroleum Ministry drafted recently a **policy on exploitation of shale gas**. The draft policy, recently submitted to the ministry, does not permit cost recovery and hence profit sharing. It banks on production-linked payment (PLP). "PLP would be a fixed percentage of revenue receipts from the shale gas or shale oil sold from the contract area, net of royalty on a monthly basis," the revised draft said. The PLP quoted at the time of the bidding for blocks assumes significance as it would carry the maximum 60 per cent weight for deciding the award of the block. The total investment quoted for completing the promised minimum work programme would

get 40 per cent weight age. As a fiscal incentive, the contractor will be exempt from PLP payment for the first five years from the start of commercial production or from the date of entering the development and production phase, whichever is earlier. The blocks would be awarded through open international competitive bidding with up to 100 per cent equity participation by foreign companies. The operating firm in a consortium would be the one which has minimum 25 per cent equity. The contract would be for 30 years with the first five years kept for exploration, appraisal and evaluation of the prospect and its feasibility. (May 4, 2012)

INDIA: Planned project - Exploration. — UG69-15

Sudhir Vasudeva, chairman of **ONGC** said recently that the company is **studying data for shale-gas deposits** and awaiting a government policy on commercial drilling for gas trapped in shale rock. "We're studying data, but it's still early days and may be four to five years before commercial drilling starts" he said. "The U.S. estimates are just estimates, and we'll have to survey the geology and deposits and drill wells before we know how much shale gas we have," Vasudeva said. "**What we do know is that India does have shale-gas reserves.**" ONGC found shale gas at a well in India's West Bengal state. The company signed an agreement with ConocoPhillips in March 2012 for developing shale resources in India and North America. India has started mapping its shale resources and will have exploration rules in place by 2013, Prime Minister Manmohan Singh said. Blocks will be auctioned in 2013 after the policy is published. (May 17, 2012)

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POLAND: Production forecast. — UG69-16

The **Polish Government** declared recently an ambitious plan to **boost gas production** in the coming five years. "Extraction of natural gas in Poland should grow by **10 bln mcm in five years.**" Treasury Minister Mikolaj Budzanowski said. In 2011, the domestic gas extraction in Poland reached 4.2 bln mcm or roughly one third of the yearly demand. "Fundamental questions after two years of shale gas exploration in Poland are: "Where are you heading to?,"

"What do you want to achieve?" commented Mikolaj Budzanowski. Minister Budzanowski re-iterated that shale gas production should start in Poland as early as 2015. The Treasury Minister announced that the National Centre for Research and Development would act as a platform of a dialogue between scientists and explorers, in order to create an effective indigenous technology needed to extract hydrocarbons from unconventional sources. (May 21, 2012)

ROMANIA: Planned project – Development plan. — UG69-17

Romgaz development director Radu Gheorghe said recently that the company **discovered shale gas in perimeters in Transylvania** and will use new exploration and production technologies in the following period in order to extract it. He added that the company discovered unconventional gas, including shale gas, ever since 1994-1995.

"You could say we accidentally produced unconventional gas until now. And now we will test new drilling technology. We are currently in a revaluation stage both in conventional and unconventional gases." Romgaz owns three exploration perimeters in Transylvania and eight in total in Romania, however very large investments are needed in order to move on to the production phase. (June 18, 2012)

UNITED STATES: Planned project – Water treatment. — UG69-18

Eureka Resources, LLC, announced recently that it will construct a **centralized wastewater treatment facility in Standing Stone Township, Bradford County, Pa.**, to treat wastewater generated during development of oil and gas wells in the Marcellus and Utica Shale. The facility will be constructed in two phases. Phase 1, expected to be completed by year-end 2012, will include pre-treatment and bulk storage tank systems capable of pre-treatment of 10,000 barrels per day of multiple fluids,

including drilling muds, flow back water and produced water. The treated water will be trucked offsite for reuse by gas well developers, temporarily stored onsite for reuse later, or disposed of through Eureka's existing Williamsport, Pa., facility. Phase 2 will include construction of a concentrated brine crystallizer that will allow Eureka to provide advanced treatment of the pre-treated effluent. Completion of Phase 2 is expected in the third quarter of 2013. (May 21, 2012)

RESERVES

UNITED KINGDOM: Resources estimates. — UG69-19

Prime Minister David Cameron convened recently a summit to hear from companies, including Royal Dutch Shell PLC, Centrica PLC and Schlumberger Ltd., whether shale gas reserves were large enough to be extracted economically and whether it could make a significant contribution to the U.K.'s energy needs.

The industry experts made it clear that the **U.K.'s shale gas reserves were smaller than first thought and could be uneconomical to extract.** In 2010, a British Geological Survey estimated that, based on experience in the U.S., U.K. shales could hold 150 billion cubic meters of natural gas. A Shell spokesman said "U.K. shale gas is unproven geologically, but we are taking a look to see what the potential might be." (May 23, 2012)

TIGHT GAS

EXPLORATION - DISCOVERIES

AUSTRALIA: Planned project – Development. — UG69-20

Transerv Energy, together with partner **Alcoa**, is studying various options to progress the **Warrow tight gas project**. These options include an extended testing program on one of the existing wells drilled by the joint venture and the drilling of new appraisal wells. The Warro Gas Field is located just 200km north of Perth and 25km east of the Dampier-to-Perth and Parmelia

gas pipelines. An earlier review by independent US tight gas experts led by Dr Keith Shanley had found that the field could hold **3 to 4 trillion cubic feet of recoverable gas**, the company said. Each well in the project is also likely to be capable of flowing at high rates and recovering between 4 and 10 billion cubic feet of gas each. (May 21, 2012)

GAS HYDRATES

EXPLORATION – DISCOVERIES

UNITED STATES: Research update. — UG69-21

Department of Energy announced recently the results of a test at **Prudhoe Bay**, in Alaska, that resulted in a steady flow of natural gas. The test was the first use of **carbon dioxide to extract natural gas**. It also was **the longest test of methane hydrate extraction: 30 days**. "There's much more field work that would need to be done. This is the very first attempt to understand the scientific processes and the behaviour of these reservoirs," Ray Boswell, the technology manager for gas hydrates at the Energy Department's National Energy Technology Lab, said. The investigators injected nitrogen and carbon dioxide and showed that this mixture could promote the production of natural gas. Another approach is based primarily on reducing pressure. The research so far suggests that this method would be the most promising way to get a commercially viable flow of natural gas, Boswell said. (May 3, 2012)

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