



U-Gas News Report

Unconventional Gas Activities in the World

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UNITED STATES: Reserves estimates. — UG65-15

The U.S. Energy Department cut its estimate for natural gas reserves in the Marcellus shale formation by 66 percent.

COALBED METHANE

EXPLORATION - DISCOVERIES

CHINA: Production update. — UG65-1

Far East Energy Corporation announce positive test results from three more appraisal wells located at significant distances from the 1H Pilot Area in the **Company's Shouyang Block**. The SYS-05 appraisal well was drilled in the southeast portion of the Company's Shouyang Block. Final test results reveal the SYS-05 to have higher gas content than any well drilled by the Company to date in the Shouyang Block, testing at a final average of 935 scf per ton (dry ash free). The well is currently producing 2180m³ (77 Mcf) per day.

The P18 appraisal well, located in the eastern part of the Shouyang Block is approximately 22 kilometers east southeast of the 1H Pilot Area, and recently began producing gas. This well peaked at over 2831m³ per day and tested at a rate of over 2265m³ per day for a ten day period with a surface flowing pressure of 40 psi. The well is currently producing about 1132m³ per day. The SYS-02 appraisal well, located nearly 20 kilometers due south of the 1H Pilot Area has been producing since May 2011. The gas content of the #15 coal at this location was measured at 635 scf per ton (dry ash free) and the permeability is estimated to exceed 100 millidarcies. (January 26, 2012)

PRODUCTION

AUSTRALIA: Production forecast. — UG65-2

With an estimated 198 Bcm of CBM resources, Australia is working to move more reserves into production. **Australia has an estimated 198 Bcm of CBM.** Queensland, in Northeastern Australia, is home to the two largest producing basins. The Bowen basin covers 160,000 sq km of Central Queensland. Queensland's CBM industry has seen considerable growth over the last 15 years, with the number of CBM wells drilled increasing from 10/yr in the 1990s to more than 600/yr in 2009 and 2010. According to a report issued by the Geological Survey of Queensland, CBM

exploration and development activity remained strong even through the recent global economic downturn. **In the 2009-2010 period, production increased to 212 petajoules (PJ) from 151 PJ in 2008-2009,** which represents more than 70% of the region's gas production. Eight export LNG projects had been publicly announced by February 2011. If all eight materialize, according to the report, more than 50 million metric tons per year of LNG could be exported from Queensland, beginning in 2013. (February 5, 2012)

SHALE GAS

EXPLORATION - DISCOVERIES

BULGARIA: Regulation. — UG65-3

Bulgaria has become the second European country after France to **ban exploratory drilling for shale gas using Hydraulic fracking.** Bulgarian MPs voted recently for a ban. Bulgaria has revoked a shale gas permit granted to Chevron. The Bulgarian drilling ban stipulates a fine of \$66m for any infringements. (January 19, 2012)

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Workshops

- A) Pre-conference workshop day: **Forecasting production and estimating reserves in unconventional Reservoirs**
Dr John Lee, Professor and Hugh Roy and Lillie Cranz Cullen Distinguished University Chair, **University of Houston**
Tuesday 28th February 2012
- B) Post-conference workshop: **Applying PRMS to unconventional resources**
John Etherington, Managing Director, **PRA International Ltd**
Friday 2nd March 2012

Expert speaker panel includes



Creties Jenkins **Conference Chairman**
Sr. Technical Advisor and Unconventional Resources Business Development Manager
DeGolyer and MacNaughton



Dr. Carolina Coll
Head of Corporate Reserves
BG Group



Dr. John Lee
Professor and Hugh Roy and Lillie Cranz Cullen Distinguished University Chair, **University of Houston**



Mike Adams
Internal Qualified Reserves Evaluator
Talisman Energy



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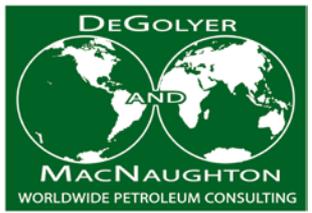


Charlotte Griffiths
Leader, Fossil Fuels Sustainable Energy Division, **United Nations Economic Commission for Europe (UNECE)**



John Etherington
Managing Director
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CANADA: Regulation. — UG65-4

The **Canadian Association of Petroleum Producers** announced recently a set of **hydraulic fracturing operating practices** that it has adopted to improve water management and water and fluids reporting for shale gas and tight gas development across Canada. CAPP President Dave Collyer said the new operating practices will help improve industry's environmental performance and transparency while ensuring responsible water management. Developed by gas producers, **the fracing practices apply to all CAPP members exploring for and producing gas in Canada**. CAPP outlined the following operating practices for fracing:

- Frac fluid additive disclosure on a well-by-well basis to identify the chemical ingredients in frac fluid additives that are listed on material safety data sheets, including trade names, general purpose, and concentrations. This information will be made publicly available.
 - Frac fluid risk assessment and management to better identify and manage potential health and environmental risks associated with frac fluid in an effort to increase market demand for the most environmentally sound frac fluids. The process for developing well-specific risk management plans for frac fluid additives will be made publicly available.
 - Baseline groundwater testing to develop domestic water well sampling programs and to participate in regional groundwater monitoring programs. This involves establishing a process for addressing stakeholder concerns regarding water well performance and to collaborate with government and other industry operators.
 - Wellbore construction and quality assurance measures to ensure proper wellbore design and installation. This includes a continuous cement barrier to protect groundwater and developing remedial plans in the unlikely event that a wellbore is compromised. Wellbore construction and quality assurance practices will be made publicly available.
 - Water sourcing, measurement, and reuse to safeguard surface water and groundwater quantity by assessing and measuring water sources, ensuring no withdrawal limits are exceeded, monitoring water sources as required to demonstrate the sustainability of the source, and collecting and reporting water use data. Water measurement, sourcing, and reuse practices will be made publicly available.
 - Fluid transport, handling, storage, and disposal to identify, evaluate, and mitigate potential risks related to the transport, handling, storage and disposal of frac fluids, produced water, flowback water and frac fluid wastes. This measure also calls for a quick response to accidental spills. Fluid transport, handling, storage, and disposal practices will be made publicly available.
- CAPP represents companies exploring for, developing, and producing oil and gas throughout Canada. (January 30, 2012)

CHINA: Auction. — UG65-5

China plans to double the number of blocks offered in its second shale-gas auction. The **Ministry of Land and Resources will likely offer more than 20 blocks in the next auction**, compared with its original plan of more than 10, Zhang Dawei, deputy director of oil and gas research at the ministry, said. **"All domestic companies and foreign joint venture firms are welcome** to participate in the bidding," Zhang said without specifying the date of the next auction. China is targeting annual output of 6.5 billion cubic meters by 2015 and 80 billion cubic meters by 2020. (February 3, 2012)

COLOMBIA: Planned project - Auction. — UG65-6

Exploration and development of Colombia's **untapped nonconventional sources of natural gas** will be the major focus of the country's bid round to formally kick off soon. **National Hydrocarbons Agency** director Orlando Cabrales said **one third of the 110 blocks to be offered** for bid in the upcoming round are thought to contain gas sources related to shale or coal. "We are just getting started in trying to develop nonconventional gas and we think the potential in Colombia is enormous," Cabrales said. In 2011, to make the gas more appealing to foreign

energy companies, **the government decreed a 40% discount on royalties on gas produced from nonconventional sources.** To boost interest in the blocks, Cabrales said his agency will soon release a geological study headed by the Universidad Nacional de Colombia incorporating nonconventional sources that may indicate a quintupling of yet-to-find gas reserves over and above Colombia's current proven figure of 7 tcf, he said.

Only two companies are currently trying to develop nonconventional gas in Colombia: Nexen, which has a shale gas property near the capital Bogota, and Drummond in northern Cesar province. Most of the blocks with shale and coal gas potential are in the Catatumbo and Mid Magdalena Valley regions, as well as in Cesar state. (January 25, 2012)

GERMANY: Update. — UG65-7

Exxon Mobil head of Central European operations, Gernot Kalkoffen said recently that company will **continue its shale search in Germany** alongside conventional gas exploration efforts, "(Germany) is most definitely an interesting market," Mr. Kalkoffen said. "We cannot achieve the energy strategy shift without gas." Nine companies including Exxon have secured options to search for natural gas in the province of North Rhine-Westphalia, which could host 2.1 TCF of natural gas. **The company would be targeting both conventional and unconventional gas resources,** Kalkoffen said. Exxon has made test drillings both for shale gas and for coal

bed methane. Currently, Mr. Kalkoffen said, ExxonMobil is waiting for the results of research into the effects of hydraulic fracturing on groundwater. Even so, he said, it was not entirely certain that the company would need to frack for shale, with a 50 per cent chance that the method would not be used. **Germany remains hesitant about the use of hydraulic fracturing** and the environmental risks posed. In March 2011, North-Rhine Westphalia imposed a moratorium on shale gas extraction, asking ExxonMobil to suspend its fracking operations in the region, which had begun in 2008, until expert (January 27, 2012)

LITHUANIA: Planned project. — UG65-8

The Polish oil company **Lotos** said recently that it would start **prospecting for shale gas in neighbouring Lithuania,** "We've decided to start our first drilling for shale gas or shale oil. Let's see what's underground," Lotos' president Pawel Olechnowicz said. **"This year we think that we will make first tests,"** Olechnowicz said after meeting with Prime Minister Andrius Kubilius. Kubilius' chief of staff Deividas Matulionis said that Lotos, which controls the Lithuanian oil company Lotos Geonafta, would carry out the first tests in fields that are already at its disposal. Matulionis said the Polish company also planned to take part in an upcoming tender for other fields close to Lithuania's borders with Poland and Russia's Kaliningrad territory. Lotos is the second biggest oil company in Poland, which has also issued scores of shale gas permits to firms including Chevron, Exxon Mobil and ConocoPhillips and aims to begin commercial shale gas production by 2014. (January 23, 2012)

POLAND: Update. — UG65-9

Exxon Mobil reported recently disappointing shale gas exploration results from two drillings in Poland conducted at the end of 2011. The firm refrained from disclosing where the drillings were conducted, but the six concessions it holds are located in the Mazowsze and Lublin regions, where the chances of finding shale gas are highest according to experts. (February 3, 2012)

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POLAND: Partnership. — UG65-10

PGNiG SA signed recently three **letters of intent for exploration** and development of shale gas resources in Poland. The three separate LOIs have been signed with **PGE, Tauron Polska Energia and KGHM**. Pursuant to the signed documents, each partner declared its will to conduct joint operations with PGNiG SA at selected locations within the Wejherowo licence

held by the Company. **The Wejherowo licence is one of 15 shale gas exploration licences currently held by PGNiG SA**. PGNiG commenced work in the Wejherowo licence area in 2010. Fracturing operations were performed at the Lubocino-1 well, confirming the presence of large shale gas accumulations. (January 30, 2012)

UNITED KINGDOM: Discovery. — UG65-11

IGas Energy Plc announced recently that it has encountered a **shale gas deposit** while drilling at the **Ince Marshes site in Cheshire in northwest of England**. In addition to drilling which encountered a net coal thickness in total of around 36 feet in multiple seams, the U.K. developer of coal-bed methane gas fields said that it found a shale section of at least 1,000 feet (304 meters) which continued past total depth. The company said that gas indications were observed across the interval. Previous independent analysis suggested a **GIIP of up to 4.6 tcf in this area**. The area, referred to locally as the Holywell shale, is part of the Bowland shale. (January 26, 2012)

PRODUCTION

INDONESIA: Regulation. — UG65-12

The **Energy and Mineral Resources Ministry** said recently that preparations are underway for a **legal framework for the development of shale gas**. The ministry's director general for oil and gas, Evita Herawati Legowo, said she received around 15 joint study proposals to examine the possibility of developing shale gas in Indonesia.

One of the companies applying for the joint study was ExxonMobil which cooperated with a local company, she said. "In terms of price, like coal bed methane, the price of shale gas will be a bit higher than the conventional gas. A better price will also stimulate more investments in the upstream sector, " she added. Evita continued that the government had not determined whether, after the planned joint study, the shale gas working area would be

directly offered to investors or if the government would create a pilot project first to ensure that the development would be possible and profitable. Energy and Mineral Resources Deputy Minister Widjajono Partowidagdo promised that the government of Indonesia would try its best to make the investment climate conducive for shale gas investors, including by discussing the possibility of providing fiscal incentives.

According to the state geology agency, Indonesia has a total potential of 570 trillion cubic feet of gas. The government has identified potential shale gas reserves in three basins in Sumatra (Balong shale, Telisa shale and Gumai shale), two basins in Java, two basins in Kalimantan and one basin in Papua (Klasafet formation). (February 7, 2012)

WORLD: Recommendation. — UG65-13

The **International Energy Agency** Chief Economist Fatih Birol said recently that the agency plans to publish, "**golden rules for the golden age of gas**" in May 2012. "We will have a series of **recommendations for governments, companies and regulators**," Birol said. Birol added that the IEA plans hold a meeting on unconventional gas in Poland with player from major gas producers,

aimed to look at best practices and what kind of regulation is needed to address concerns about the industry.

Birol said that concerns about water and chemicals overuse and contamination can be addressed by best technologies and practices. However, despite its global potential, Birol said that it was unlikely that shale gas production would kick off in Europe in the near future. (January 29, 2012)

RESERVES

IRELAND: Resources estimates. — UG65-14

Tamboran Resources said recently that it is prepared to invest 7 billion euro in the extraction of shale gas. It was granted a Licensing Option by the Department of Communications, Energy, and Natural Resources in 2011 and **is focusing its Ireland operations in the northern area of County Leitrim**. It was also granted an Exploration Licence in an adjacent area in Northern Ireland where it is focusing on southwest County Fermanagh. The company said it has

now completed the first part of its analysis to determine the feasibility of shale gas exploration here. The initial tests show that it has the **potential for ultimate production of up to 2.2 trillion cubic feet of shale gas**. Subject to an exploration licence being granted by the Irish authorities, Tamboran believes exploration drilling could commence by 2014. (February 1, 2012)

UNITED STATES: Reserves estimates. — UG65-15

The **U.S. Energy Department** cut recently its estimate for natural **gas reserves in the Marcellus shale** formation by 66 percent, citing improved data on drilling and production. About **141 trillion cubic feet** of gas can be recovered from the Marcellus shale using current technology, **down from the previous estimate of 410 trillion**, the department said in its Annual Energy Outlook. About 482 trillion cubic feet can be produced from shale basins across the U.S., down 42 percent from 827 trillion in last year's outlook. (January 24, 2012)

TIGHT GAS

EXPLORATION - DISCOVERIES

CANADA: Acquisition. — UG65-16

PetroChina, a unit of China National Petroleum Corp. signed recently a binding agreement to **purchase a 20% stake in Royal Dutch Shell PLC's Groundbirch assets** in Northeastern British Columbia. Shell believes production from the Groundbirch assets could approach 500,000 Mcfd by 2014. In 2009, Shell said the Sunset-Groundbirch tight gas play produced 100,000 Mcfd. The importance of the sale turns more on the acquisition of technology than on reserves or production. PetroChina acknowledged that point, saying it hopes to gain experience in the exploration and development of unconventional gas resources through its cooperation with Shell. (February 6, 2012)

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