

U - Gas News Report

Unconventional Gas Activities in the World

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COALBED METHANE

EXPLORATION – DISCOVERY

AUSTRALIA: Planned project – Production start up - UG 78-1

AGL restarts Glenaras CBM pilot

Australia's AGL Energy has restarted the Galilee gas project pilot at Glenaras in the Australian state of Queensland in order to establish first coalbed methane (CBM) reserves in the Galilee basin. Joint venture partner Galilee Energy said recently that commissioning activities had started at the GA04 well on 19 March, with water being pumped from the coal seams in the Betts Creek beds to the holding pond.

Following a successful flow test at GA04, the GA06 well was started on 21 March, followed by GA02, GA03 and GA05 over the next two days. All five wells at the project were delivering stable

operations with early signs of CBM desorption detected in the GA02, GA04 and GA06 wells.

"Restart of the Glenaras pilot marks the successful completion of a **detailed engineering review to identify weaknesses in the original artificial lift system and implement key changes to deliver a stable, robust and reliable system,**" the company stated. The joint venture's aim is to demonstrate a **commercial gas flow rate**, as well establish first reserves in the Galilee basin.

The Glenaras pilot first flowed coalbed methane (CBM) from the GA06 well in late 2011. The well flowed at a steady rate of 54,000 cubic feet per day for four days before being shut down for maintenance. (April 2, 2013)

INDIA: Planned project – Tender - UG 78-2

ONGC to soon farm out stake in CBM blocks

India's Oil and Natural Gas Corporation will shortly award stakes in its four coal bed methane gas blocks, Business Standard reports. Companies that bid for ONGC's stake in January are Great Eastern Energy Corporation (GEECL), Brisbane-based Dart Energy and a consortium of Jindal Steel and Deep Industries. ONGC intends 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.

According to ONGC estimates, the Jharia block holds **85 billion cubic metres of gas reserves**. North Karanpura holds **62 bn cu metres**, Bokaro holds **45 bn cubic meters** and Raniganj North holds **43 bn cubic metres**. (March 26, 2013)

RESERVES

CHINA: Reserves estimates - UG 78-3

Far East Energy announces Shouyang CBM block reserves estimate

Far East Energy Corporation has announced the release of a reserves update with respect to its coalbed methane project located in the Shouyang block in Shanxi Province, China as of December 31, 2012. The updated report indicates that the net total proved reserves are now **approximately 303.7 Bcf**, with estimated future net cash flow, on an NPV10 basis, of approximately \$1.1 billion.

The net total proved and probable reserves are now approximately **440.8 Bcf**, with estimated future net cash flow, on an NPV10 basis, of approximately \$2 billion. The net total proved, probable and possible reserves to be approximately **552.3 Bcf**, with an estimated NPV10 of \$2.8 billion.

The report was prepared by RISC Operations Pty Ltd (RISC), an internationally recognized independent petroleum advisory evaluation and valuation firm based in Perth. (April 16, 2013)

ENVIRONMENT

AUSTRALIA: Environmental assessment - UG 78-4

'Fracking' emissions monitoring to be tightened

The federal government has signalled that it will tighten monitoring of **greenhouse gas emissions from coal seam gas "fracking" projects** following a heated debate about how much the industry contributes to global warming. In a discussion paper released recently, the government proposed that by 2015 companies would have to directly monitor "fugitive" methane emissions from coal seam gas production where fracking is used.

The proposals follow complaints from some researchers and green groups that the amount of methane – a powerful greenhouse gas – emitted by the coal seam gas (CSG) industry is under reported.

All industries that produce large amounts of greenhouse gases are required to monitor, count, and verify their emissions to the federal government. But in some industries, estimates are used instead of direct monitoring of emissions. Currently, the emissions estimation method for the gas industry do not account for differences between conventional natural gas development and coal seam gas production, such as the use of fracking.

The government proposes the monitoring changes would be **voluntary from July 2013, and only become mandatory from July 2015**. A joint study with the CSIRO will help test and model emissions from Australian CSG projects in NSW and Queensland. The government also intends to develop a method for identifying emissions from decommissioned CSG wells. (April 17, 2013)

SHALE GAS

EXPLORATION – DISCOVERY

ARGENTINA: Planned project – Agreement - UG 78-5

Dow signs MoU with YPF for Vaca Muerta shale gas pilot project

DOW CHEMICAL and YPF have signed a memorandum of understanding to develop the El Orejano prospect in the Vaca Muerta shale gas region. The deal was signed by YPF president and CEO Miguel Galuccio, and Dow's president of the southern Latin America region Jorge La Roza. Under the terms of the deal, **Dow will take a 50% share in El Orejano**, which covers an area of 41 km², and the **two companies will develop a shale gas extraction pilot project**. They will also work together to identify new opportunities to expand Argentina's petrochemical industry.

YPF's MoU with Dow to develop parts of the Vaca Muerta region follows two other deals with Chevron and Bidas signed in December 2012. Chevron is to drill 100 pilot holes in the region after signing a US\$1bn deal, while Bidas took a 35% interest in the Bajada de Añelo area of the field and a 24.5% interest the Bandurria area following a US\$1.5bn deal.

YPF is keen to develop the Vaca Muerta asset, but is facing strong **opposition from Spain's Repsol**, which claims it is the rightful owner. (March 27, 2013)

EUROPE: Investment opportunities - UG 78-6

Chevron makes eastern Europe its unconventional target

Of all the companies with a strategy for targeting unconventional gas outside of North America, Chevron seems to have pulled out the most stops, taking acreage in no fewer than **five countries across eastern Europe**. The scale of its shale gas position across Poland, Romania, Ukraine, Lithuania and Bulgaria is vast, covering millions of acres in areas that are relatively sparsely populated.

Its ambition to develop a major shale gas position in the region is not without its challenges though, and opposition to the use of hydraulic fracturing, in the development of shale gas continues to be the company's Achilles' heel.

Most recently, in **Lithuania**, people took to the streets carrying placards saying "Chevron -- Go Away!" -- hardly the ideal environment for creating

a new gas industry (more in the previous news). In **Bulgaria**, a ban on fracking remains in place following public opposition to the technique on environmental grounds. In Bulgaria, Chevron will have to wait for the fracking ban to be lifted before any meaningful work can begin. Chevron has drilled three wells in **Poland** so far and continued exploratory drilling is expected this year. In **Romania**, Chevron plans to drill an exploration well during the second half of 2013, while in Lithuania its JV plans to start exploration work later this year. In **Ukraine**, the government is finally opening up to international participation in its upstream, but as US company Vanco Energy knows, progress can be painfully slow. Chevron may well be committed to eastern Europe in the medium and long terms, but **it will have to be patient in a region where delays and political interference are common**. (April 2, 2013)

KUWAIT: Planned project – Production forecast - UG 78-7

Kuwait mulls exploring for shale gas

Kuwait is looking to extract shale gas from its northern fields and expects to produce **150-200 million cubic feet per day** under the right conditions,...., if Kuwait goes ahead with the plan it would work with a company specialised in shale gas production, oil sector official said. Production will depend on technology as gas reservoir is complex and declined to give a time frame for when production could start, according to the official. (April 10, 2013)

Strategy and opportunity for the UK's gas producers and their partners

25-26 June 2013, Manchester, UK

Shale Gas World UK is where you'll meet the leading operators and key stakeholders in shale gas and unconventional resource development in the UK. Learn from Eric Vaughn at Cuadrilla and Andrew Austin at IGas how they intend to commercialise shale gas reserves.

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Eric Vaughn
Well Services Director
Cuadrilla Resources



Andrew Austin
Chief Executive Officer
IGas plc



Mike Stephenson
Head of Energy
British Geological Survey

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LITHUANIA: Planned project – Environmental assessment - UG 78-8

Chevron Lithuania shale-gas deal delayed to May for law changes

Lithuania will wait to sign a shale-gas exploration agreement with Chevron Corp. until Parliament amends laws to strengthen environmental regulations; “hopefully in early May we can start getting ready for actual exploration.” Prime Minister Algirdas Butkevicius said.

Chevron last year bought half of the Lithuanian oil and gas recovery company LL Investicijos and in January submitted the only bid in a tender for shale-gas exploration rights in the Baltic nation. Two parliamentary committees recently urged the government to ban exploration until laws regulating such activity are strengthened. The main change would be a new **requirement for an environmental impact study** of exploration, separate from the study required for potential later production of any shale gas that is found.

The prime minister said shale gas should get a chapter of its own in a national energy strategy that the government is preparing, since it may help reduce dependence on imports of natural gas from Russia. (March 21, 2013)

SAUDI ARABIA: Investment opportunities - UG 78-9

Saudi Arabia’s shale gas challenge

Saudi Arabia’s plans to explore its vast shale gas reserves—potentially the fifth largest in the world—will take years. **The success of this project will depend on the economic feasibility, especially in regards to limited water supplies** that would require a robust desalination capacity expansion. Saudi shale gas could become a **game changer** for the country and for world oil markets. The evolving technology could eventually allow the country to significantly boost its insufficient natural gas production, which is indirectly eating into its oil revenue, while government spending increases.

The problem is only getting worse as domestic demand soars due to the growing population and economic expansion. Exploring for shale gas (or any natural gas source, for that matter) is urgent. Saudi Arabia already has to burn around a quarter of its oil production of nearly 10 million barrels per day to meet domestic demand, more in per capita terms than any industrialized nation. Its oil use in relation to its economic output is twice the global average.

“The obvious conclusion is that it’s in their interest to **substitute oil in power stations with gas**. They can get more from selling oil,” said Paul Stevens, a senior energy research fellow in Chatham House. “If the government wants to

develop its shale gas faster, it will. It’s not like Europe, where there are regulatory barriers. The barrier there is water, but they can overcome it,” Dr. Stevens said. There are multiple alternatives to shale gas, of course, from developing nuclear or renewable power to cutting generous subsidies or importing gas from Qatar or Iran. But the easiest—and potentially the cheapest—option is clearly to produce more gas at home. “We have rough **estimates of 600 trillion cubic feet of unconventional shale gas**. The potential is very huge and we plan to exploit it,” said Saudi Minister of Petroleum and Mineral Resources Ali Al-Naimi earlier this month. Exploratory drilling will begin this year, he said.

The only obstacle is uncertainty over the economic viability of such a project. Shale gas is extracted by hydraulic fracturing which is an energy- and water-intensive technology that blasts pressurized water, sand and chemicals into vertically- and horizontally-dug wells in shale formations.

The feasibility of producing shale gas will largely depend on the real volumes of production, which will not be known for years. The volume would have to be huge, because a portion of any extracted gas would first have to supply the associated power generation and water desalination capacity that is required. (March 30, 2013)

RESERVES

ARGENTINA: Discovery - UG 78-10

Americas Petrogas makes Argentina discovery

Canadian energy company, Americas Petrogas, announced it made a shale natural gas discovery onshore in the Vaca Muerta shale formation in Argentina. A vertical well was drilled on the Los Toldos I block, the well was hydraulically stimulated with four stages. It was able to produce as much as **3.2 Mcf of natural gas during initial production tests**.

Regional Managing Director Guimar Vaca Coca said the find is situated less than a mile away from a major natural gas pipeline. The deal is for shale reserves in more than 10,000 acres in Neuquen province.

The U.S. Energy Department’s Energy Information Administration estimates that **Argentina has 774 Tcf of technically recoverable shale gas resources**, the third most in the world. (April 15, 2013)

SUPPLIES - IMPORTS - EXPORTS

NORTH AMERICA: Partnership - UG 78-11

Qatar, Exxon to assess unconventional gas in North America

Qatar Petroleum International and Exxon Mobil Corp. have agreed to jointly assess unconventional gas resources in North America and global opportunities in LNG, Reuters has reported. Both companies are involved in LNG projects in Qatar. They also have shared interests in LNG terminals in the United Kingdom, Italy and the US.

In a joint statement Qatar Petroleum International (QPI) and ExxonMobil said the agreement sought to **give QPI opportunities to explore various unconventional natural gas resources and associated liquids.** (April 15, 2013)

UNITED STATES: Gas supply - UG 78-12

US poised to approve shale gas exports to Japan

The US government is in the final stages of lifting its embargo on shale gas exports to Japan, Kyodo News Agency reported recently. The Energy Department is expected to give conditional approval, including on total volume control, as early as April and then start examining shale gas export projects involving Japanese companies, according to Japanese source. **The first approval for shale gas export projects could be given by this summer.** Applications for nearly **20 shale gas export projects**, including from Japanese

trading houses and utility firms, have been filed with the US government. Japan is the world's No. 1 LNG importer, taking in a record 87.3 million tons in 2012.

The US has remained cautious about exporting shale gas to countries without free trade agreements, allowing exports to such countries only if each business project is deemed a public good after examination.

Since it takes time to build necessary infrastructures for shale gas exports and arrange means of transport, **actual shale gas shipments to Japan will likely begin in 2017 or later.** (March 28, 2013)

ENVIRONMENT

NETHERLANDS: Environmental assessment - UG 78-13

Opponents are winning the Dutch shale gas war

Support for extracting shale gas from under the Netherlands is fading and an increasing number of local councils are taking a stand, the Financieele Dagblad reports recently. So far, 33 of the country's 400 local authority areas have declared they are opposed to shale gas extraction, according to the newspaper. Some 170 councils are thought to be sitting on shale or coal gas reserves.

The Netherlands' shale gas reserves could run into billions of euros but **it is unclear if the gas will ever be extracted because of the well-organised opposition**, the paper says. In addition, national politicians are staying out of the debate, pending the results of a **major report into shale gas extraction.**

The paper points out that national government can still overturn local council objections and press ahead with shale gas extraction. (April 2, 2013)

SPAIN: Environmental assessment - UG 78-14

Shale-rich Spanish region votes to ban fracking

Lawmakers in Spain's northern Cantabria region unanimously voted recently **to ban hydraulic fracturing on environmental concerns**, shooting down the central government's hopes for a project to boost jobs in a region believed to be rich in shale gas. Spain, battling a deep recession and high unemployment, imports about 76% of its energy needs and the technology to extract shale gas could help relieve its foreign dependence on oil, coal and gas.

Early estimates indicate Spain has **large shale gas reserves**, but environmentalists have voiced concerns over the safety of the technique. Cantabria's ruling People's Party (PP), which has an absolute majority in the regional parliament, proposed the law to ban the practice. **"In Cantabria, there is a very large social movement against fracking...** the bill will be passed unanimously by the three parliamentary groups. The region is very small and highly populated," a PP source told.

However, **at a national level, the PP has voiced support for hydraulic fracturing** as long as it complies with environmental rules. The ruling PP, which controls the Spanish parliament, could seek to appeal or overturn Cantabria's ban. (April 9, 2013)

SOUTH AFRICA: Environmental assessment - UG 78-15

South Africa shale-gas permits unlikely in 2013 on appeals

Explorers including Royal Dutch Shell Plc are unlikely to get hold of shale gas permits in South Africa this year because of potential legal appeals, according to law firm Bowman Gilfillan.

South Africa in September lifted a moratorium on hydraulic fracturing to assess the Karoo. Shell in 2011 applied to drill 24 exploratory wells in the arid area of western South Africa. The Karoo may hold **485 trillion cubic feet** of shale resources, U.S. Energy Information Administration data show.

A taskforce of government agencies including the Department of Mineral Resources, or DMR, is **studying best practice on fracking and plans to complete a draft by July, to be followed by public consultation**,..., landowners and other environmental groups will move to block the granting of exploration licenses, Adderley said.

"We are waiting for the DMR to give the go-ahead," Lindiwe Mekwe, general manager for regulations at Petroleum Agency South Africa. (April 16, 2013)

GENERAL INFORMATION

EUROPE: Investment opportunities - UG 78-16

European industry flocks to U.S. to take advantage of cheaper gas

The sprawling chemical plant in Ludwigshafen along the Rhine River has been a jewel of Germany's manufacturing-led economy for more than a century. But the plunging price of natural gas in the United States **has European companies setting sail across the Atlantic to stay competitive.**

German chemicals giant BASF, which operates the plant here, has announced plans for wide-ranging expansion in the United States, where natural gas prices have fallen to a quarter of those in Europe, largely because of American innovations in unlocking shale gas. Among those **most affected are energy intensive industries** such as steel and chemicals, because they use natural gas as a raw material and power source. With Europe lagging in energy production, manufacturers on the continent warn that a **chain reaction** could shift more and more investment to U.S. shores. "It's become clear, with the drop in gas and electricity prices in the United States, that we are, at the moment, at a significant

disadvantage with our competitors," said Gordon Moffat, director general of Eurofer, the main lobbying group for European steel manufacturers. As new dollars pour into the United States, the outflow from Europe is costing jobs and weighing on decisions about ambitious and expensive green-friendly policies that critics say are contributing to the energy-price gap.

Here in Ludwigshafen, many people view the United States as the land of the future. Since 2009, BASF has channeled more than \$5.7 billion into new investments in North America.

"It's a very slow process, but it's a continuous one,"..., once a customer of ours decides to build a new factory in the U.S., then this customer will request from us to be close by with our production. And so, over time, you see a **self-accelerating process**, which will move production into the U.S.," said Harald Schwager, the head of BASF's European operations

"If the energy prices remain so much lower in the United States than here, of course that will endanger jobs", said Robert Oswald, the head of BASF's union. (April 1, 2013)

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