

# U - Gas News Report

Unconventional Gas Activities in the World

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by Constancio Silva

## N°79 – May 2013

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## COALBED METHANE

### PRODUCTION

#### **INDONESIA: Planned project – Start up - UG 79-1 NuEnergy Gas to start pilot production at Sumatra coal seam gas project**

NuEnergy Gas expects to start pilot production at its Muara Enim gas pilot in Sumatra, within two weeks after completing the radial jetting hydraulic fracturing program. A total of 15 laterals were completed across five coals seams with an average lateral length of 32 metres and total lateral length of 485 metres being achieved.

This is expected to stimulate higher water and gas production rates from the first pilot well and provide guidance as to optimal completion techniques for the following two pilot wells to be drilled from June this year.

NuEnergy is also in the process of short listing drilling contractors with a view to committing to a two well development program (with options to drill more) to complete the Muara Enim PSC pilot production site. The drilling of the next two pilot wells is scheduled to commence within the next six weeks.

The company has secured a commitment from compressed natural gas producer Dharma Pratama Sejati to offtake between 1 million and 5 million standard cubic feet of gas at a price of US\$10 per million British Thermal Units. NuEnergy has a 40% interest. (May 22, 2013)

### COMPANIES

#### **AUSTRALIA: Tender - UG 79-2**

##### **PetroChina drops bid for Australian coal seam gas**

PetroChina has dropped its \$185 million bid for Australia's coal-seam gas company WestSide Corp. PetroChina told WestSide that it withdrew its non-binding offer, submitted in November, "because the **general situation in Australia has changed** so much," The Australian reported recently. "You're seeing a lot of reports about changing costs, environmental issues, exchange rates and increased regulations in Queensland," WestSide Executive Chairman Angus Karoll told The Australian.

PetroChina's decision comes ahead of an **expected gas shortage** in Queensland that is expected to boost gas prices. "Over the past 12 months, the company has observed increasing shortages of gas for Queensland's LNG projects and to satisfy domestic demand," WestSide said. (May 15, 2013)

## SHALE GAS

### EXPLORATION – DISCOVERY

#### **EU: Planned project – Talks - UG 79-3**

##### **EU leaders pursue shale gas dream in Brussels talks**

European leaders discussed the region's reserves of shale gas at a summit recently, **but the prospect of the continent enjoying a US-style shale boom that drastically cuts energy costs remains elusive.**

British Prime Minister David Cameron, whose government is advancing plans to exploit his country's shale gas deposits, said Europe could not afford to be left behind as the world scrambles to develop the resource.

For the European Union, there is no **broad-based agreement on how shale gas should be developed**, with some of the EU's 27 member states completely opposed to any exploration, others in two minds and a few fully committed to it. At the same time, the European Commission says environmental standards must be maintained, and potential investors in shale gas have to consider Europe's more complex land-ownership and mineral extraction laws. Other issues include the greater depth of EU shale gas reserves compared with the United States, which can increase drilling costs by a factor of three, analysts say.

Of EU nations, the eastern states of Poland and Lithuania are among the keenest to cut their reliance on imports of natural gas from Russia by developing shale gas of their own or importing it in liquid form from the United States.

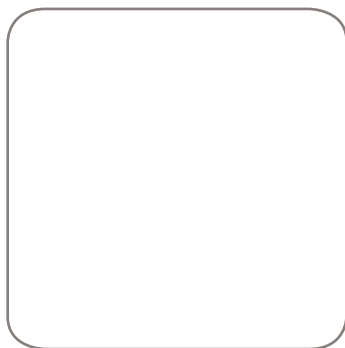
While gas prices in the European Union are roughly four times higher than in the United States, analysts say US prices will inevitably rise as production costs can exceed income from the gas. (May 23, 2013)

# 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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# ShaleGas

## WORLD

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**CZECH REPUBLIC: Regulation - UG 79-4**

**Czech leader says shale mining not on the agenda**

The Czech Republic will continue its policy of support for diverse energy including nuclear, but has **no plans to follow other European countries in developing shale gas**, the country's prime minister Petr Nečas has said. Nečas stressed that the **adoption of relevant legislation was a precondition of shale gas**

**prospecting and mining.** The Czech leader said local authorities would not be opposed on policy in this respect. To date, the Czech Republic has had moratorium on shale gas exploration. Regarding the existing programme for nuclear energy, he said his government continues to support the Temelin nuclear power plant in southern Bohemia, despite criticism of its economic prospects. (May 24, 2013)

**ROMANIA: planned project – Drilling campaign - UG 79-5**

**Chevron plans to start Romania shale gas exploration**

U.S. oil major Chevron said recently it plans to start exploration for shale gas in Romania, where the government has sounded increasingly amenable to allowing mining by fracking. The U.S. EIA estimates **Romania and neighbouring Bulgaria and Hungary could have 538 billion cubic metres of shale gas** between them, slightly more than Europe's annual consumption and enough to cover Romania's gas needs for almost 40 years.

Chevron will conduct a 2D geophysical study near the Black Sea and plans to drill exploratory shale wells further north in Vaslui county. The company did not give a specific date for starting work. Chevron has rights to explore for shale in three blocks of 670,000 acres (270,000 hectares) near the Black Sea, and has also bought the concession in Vaslui for an undisclosed amount.

The extraction of shale gas requires hydraulic fracturing. Experts say that if it is done according to best practice it is environmentally safe, but the technology still provokes **public concern**. Initially opposed to shale gas, the leftist coalition government of Victor Ponta has shifted its stance since gaining power in 2012 and now supports exploration, in pursuit for energy independence for Romania.

Romania **will soon launch tenders to expand shale gas exploration** after Chevron took the lead this month as the government seeks to reduce dependence on costly imports, the energy minister said recently. (May 23, 2013)

**PRODUCTION**

**INDONESIA: Planned project – Agreement - UG 79-6**

**Pertamina to sign first shale gas development contract**

Indonesia's Pertamina is the first company in the country to sign a contract for development of shale gas, according to Antara News. The contract was signed during the first day of the annual Indonesian Petroleum Association (IPA) Conference and Exhibition in Jakarta. Director General for Oil and Gas of the Energy and Mineral Resources Edy Hermantoro said that the first

shale gas production was **expected in five years to come, namely in 2018.**

The location of Pertamina shale gas working area is in North Sumatra near the border with Aceh province. Provisional data indicated that shale gas reserves in the area accounted for about **16 trillion cubic feet**. He said that based on regulations, Pertamina could directly appoint a company for the development of shale gas without being required to call tender for its exploitation. (May 15, 2013)

**POLAND: regulation - UG 79-7**

**Poland will not tax shale gas output until 2020**

Poland will not collect taxes on the production of shale gas until 2020 to make its extraction **more financially attractive** after several foreign players quit the Polish market in the past few months, the finance minister said. Attracting investors grew harder after the country drastically scaled back estimates for reserves. Exxon Mobil, Canada's Talisman Energy and US oil firm Marathon, all quit their Polish shale gas operations, with some of them citing uncertainty about the regulatory environment as a factor, that is weight of delays in fiscal and regulatory reforms and excessive bureaucracy.

"The law on the **taxation of shale gas will go into effect in 2015, but we will not levy the tax until 2020** to attract companies to extract shale gas," Finance Minister Jacek Rostowski said recently. The departure of several players put pressure on the government to make the terms more favourable if it is to meet its ambition of being Europe's biggest producer of shale gas.

The US Energy Information Administration originally estimated Polish shale gas reserves at 5.3 trillion cubic metres, but this was subsequently revised downwards to about a tenth of that figure. Early drilling suggested it would be more difficult to extract, significantly raising costs for the producers. (May 23, 2013)

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**UNITED KINGDOM: Regulation - - UG 79-8**  
**Extracting UK shale gas will be costlier than US**

UK shale gas may not flow as cheaply as the reserves in America, disappointing many in North East industry.

Mike Ducker, manufacturing director at SABIC petrochemicals in Wilton, told Journal Energy: "The bottom line is that there are significantly cheaper feed-stocks in the United States and Middle East and something has to be done. "There is a squeeze on in Europe and we need to get our skates on with shale gas." Ten days ago SABIC (Saudi Basic Industries Corp) announced it was cutting 1,000 jobs in Europe with 160 going at its two plants at Wilton, Teesside. The continent's economic woes mean SABIC cannot grow its way out of trouble and, with American and Middle East energy up to 75% cheaper than the UK and Europe, it says it needs to cut costs.

Fertiliser manufacturer GrowHow, where energy costs can account for almost 70% of its total production costs, employs 200 people in the region. The public affairs director Deborah Pritchard-Jones says: "Gas is a vital feed-stock, and competitively priced gas is important to a business like ourselves. We are looking for the Government to be pro-active."

Lately the Select Committee on Energy and Climate Change released findings of a two year investigation into the potential of the UK's shale gas industry. It says **the Government should encourage development but cautioned gas would not come as cheaply as it does in the United States.** The committee said **differences in geology, societal concerns and the need for carbon capture and storage infrastructure** are likely to mean higher prices in the UK.

Over the next few weeks the Government is also expected to release the British Geological Survey (BGS) findings on the extent of the UK's shale gas reserves. The survey is slated to show there is between **1,300 trillion and 1,700 trillion cubic feet, of shale gas in the UK** dwarfing previous estimates of 5.3 trillion cubic feet.

Back to SABIC on Teesside, the company is adopting a pragmatic approach to its current **energy dilemma.** It is currently investigating the potential to shift from naphtha as the feed-stock for its Teesside plants to liquefied petroleum gases (LPG) such as ethane, propane and butane. Ducker continued: "We are expecting LPG prices to go down as shale gas's share of the market increases and reduces demand for LPGs". (May 1, 2013)

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**UNITED STATES: Investment opportunities - - UG 79-9**  
**LNG plants on barges a solution for shale**

Onshore natural gas stole the attention of offshore experts at the Offshore Technology Conference in Houston recently. With so much cheap natural gas in the United States, some companies are looking for ways to siphon the resource out of pipelines and onto barges.

Those barges could be a cheap and versatile way to liquefy natural gas so that it can be easily shipped overseas. The floating LNG barges would not be able to match the scale of large projects being proposed along the coastlines, but they would be **cheaper and have the ability to move to different locations.** They could be located off the coasts of Texas, Louisiana, or even Maryland, said Joe Verghese, an executive at WorleyParsons.

According to Black & Veatch, for one design configuration a floating LNG barge could cost in the hundreds of millions of dollars with a **maximum capacity of around 2 million tons per year.**

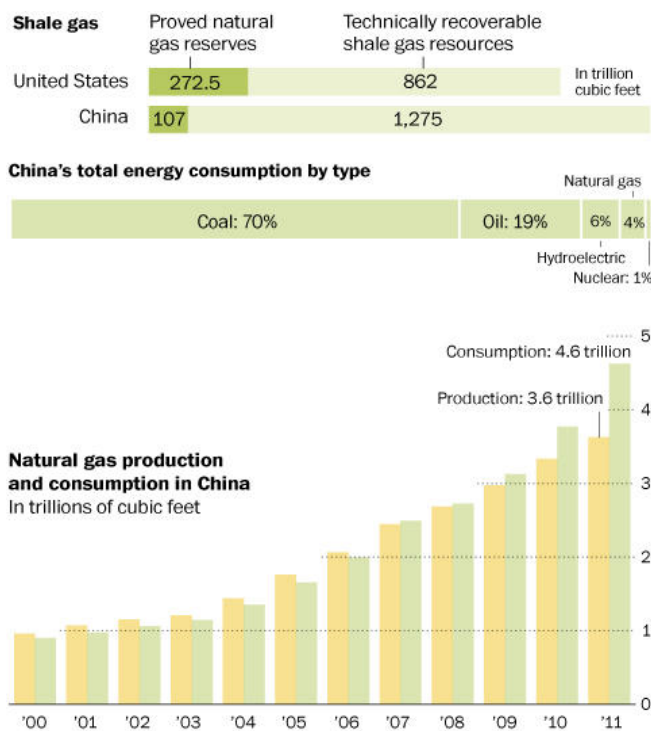
Barges along the U.S. coast could be stationed at docks and tap into gas pipelines. That would allow them to benefit from other companies that processed the gas before putting it into a pipeline system, Verghese said. It would also help companies avoid any permitting complications or objections from residents who may not want an LNG plant built near them, he said. (May 6, 2013)

**RESERVES**

**CHINA: Planned project – Production forecast - UG 79-10**

**China’s struggles to tap its shale gas**

China’s **recoverable shale gas reserves could be 50% larger than those in the United States** according to US EIA, raising the potential for those resources to help meet China’s growing energy demand and ease its reliance on electricity from coal-fired power plants.



Source: U.S. Energy Information Administration. The Washington Post. Published on April 30, 2013

But **progress on China’s shale frontier has been slow**. About 60 shale exploration wells have been drilled over the past two years, according to the consulting firm IHS CERA, about as many as are drilled in North Dakota every 10 days. And there has been **no Chinese shale production**. China’s shale gas deposits may be large, but they are remote, and in most places, there is not enough water to provide for the hydraulic fracturing technique used to create cracks that unlock gas trapped in the rock.

More important, oil experts say, burrowing through **China’s regulatory layers is no small feat**. In the United States, independent oil companies bought mineral rights owned by private individuals, then pushed ahead with drilling and production. In China, lumbering state companies dominate the landscape, and mineral rights are owned by the state — although which state bureaucracy is in charge of regulation has been a matter of dispute.

Chinese National Energy Administration’s goal is to produce 230 billion cubic feet of shale gas a year by 2015 and 3.5 trillion cubic feet a year by 2020. “There’s a lot of **fantasy right now about the speed at which shale in China will scale**. Almost none of the factors that allowed for ready expansion of shale in the U.S. are present in China — except, perhaps, the geology,” said David Victor, director of the University of California at San Diego’s international law and regulation program.

China has never been a major natural gas producer or consumer. Natural gas provides just 4% of China’s total energy, compared with more than 25% in the United States according to the EIA. Much of that gas is supplied to major cities, with **rapid urbanization** expected to last another decade or more, demand for natural gas is heading higher.

China’s 12th five-year plan aims to boost natural gas to 8% of national energy use by 2015. To get there, China plans a jump in imports as well as tapping domestic supplies of shale gas and coal-bed methane. It already imports LNG from Qatar, more LNG is on the way as projects in Australia and Southeast Asia expand. Less likely: imports from Russia. China has haggled with Moscow for years about possible gas pipelines from Russia. ( April 30, 2013)

# UNDERGROUND GAS STORAGE in the World



## THE FIFTH EDITION OF CEDIGAZ'S REFERENCE REPORT ON "UNDERGROUND GAS STORAGE IN THE WORLD" WILL BE PUBLISHED IN JUNE 2013

Since its first publication in 1990, "Underground Gas Storage in the World" has been the industry's reference on underground gas storage (UGS). The updated 2013 edition includes in-depth CEDIGAZ's analyses of the latest developments and trends in the storage industry all over the world as well as extensive country analyses with complete datasets including current, under construction and planned UGS facilities for more than 40 countries. Future storage demand and its main drivers are presented at global and regional levels.

### COVERED TOPICS INCLUDE:

#### **USA: Shale Gas Spurs a New Wave of Storage Development**

The massive pipeline expansion consecutive to the shale gas revolution and the growing use of gas in power generation have increased the need for storage capacities and particularly for high-deliverability storage. The working gas capacity of salt caverns has risen accordingly, almost doubling over the last three years. This trend is expected to continue with the development of new shale plays and stricter regulation on gas flaring.

#### **Europe: Liberalization Means New Roles for UGS but Overcapacity is Painful**

Market liberalization and increased trading in Europe are changing the way UGS is used, increasing the need for flexibility and adding value to salt caverns. But these developments take place against the background of a depressed gas demand and storage overcapacity that takes a toll on some major players. Future gas supply and demand trends and the deepening of market liberalization might reverse this negative situation.

#### **CIS: Gazprom's Expansion Plans in Europe**

The objective of Gazprom is to develop storage capacity closer to its markets and main export routes. The company projects to expand its working gas capacity in Europe to 5% of its annual exports. With the recent takeover of Wingas, WIEN and WIEE, Gazprom emerges as a major actor in European trading and storage.

#### **China: the Birth of a Giant Storage Market**

Irrespective of China's success in developing its huge shale gas resources, UGS will have to be developed on a large-scale to accommodate a massive increase in gas consumption. Chinese experts expect a growth in working gas capacity to 110 billion cubic meters by 2030 (up from 4 billion cubic meters in 2011) but this development needs to overcome several geological, technological and economic hurdles.



### COUNTRIES SURVEYED

**North America:** Canada, USA.

**Europe:** Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Portugal, Poland, Romania, Serbia, Slovakia, Spain, Turkey, United Kingdom.

**CIS:** Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Russia, Ukraine, Uzbekistan.

**Asia/Oceania:** Australia, China, India, Japan, New Zealand, Pakistan, Taiwan

**Rest of the World:** Argentina, Mexico, Iran

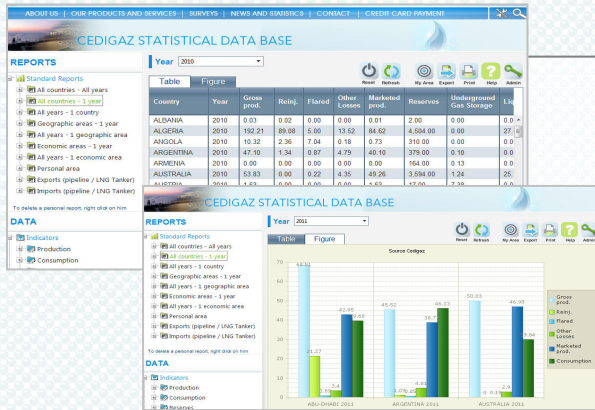
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CEDIGAZ is an international association dedicated to natural gas information. Since its creation in 1961, CEDIGAZ has been recognised by the gas industry as one of the most reliable and independent sources of information on the whole gas chain.

CEDIGAZ products include "Natural Gas in the World", an exhaustive annual survey on gas markets published since 1983, databases and news reports. The **CEDIGAZ Underground Gas Storage Database** is the only worldwide storage database to be updated every year.

## ABOUT THE AUTHOR

Sylvie **Cornot-Gandolphe** has a long and proven experience in global gas and energy markets and is the author of the first CEDIGAZ report on "Underground Gas Storage in the World" in 1990. A renowned expert on global energy commodities, she is the lead author of the studies on "Flexibility in natural gas supply and demand" and "Security of gas supply in open markets" published by the International Energy Agency in the 2000s. Her latest works include a recently published report on Global Coal Trade.



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## SUPPLIES - IMPORTS - EXPORTS

### UNITED KINGDOM: Planned project – Production forecast - UG 79-11

#### Shale could be new North Sea of UK

Britain's shale gas reserves could "be a new North Sea for Britain", meeting **more than a third of annual gas needs**, reducing dependence on imports and generating significant tax revenues, according to the Institute of Directors. The conclusions, outlined in a report recently, are published as ministers prepare to announce **new tax breaks for shale gas and increased estimates of UK reserves** next month; there is still uncertainty over the size of UK reserves, with the industry waiting for a new estimate from the British Geological Survey. They also come as potential development of shale reserves sparks public anxiety and environmental concerns, and fierce debate about costs and the role of the resource in meeting future energy demand.

Cabinet ministers are pushing hard to accelerate fracking in the UK, with David Cameron telling a New York business audience this month he was "pretty jealous" about the US industry.

However, environmentalists are concerned the process can pollute groundwater and emit methane, a potent greenhouse gas. The IoD says **environmental concerns are a key barrier to development**. Companies should be forced to disclose all the chemicals used in the fracturing fluid at each site, as well as how much water would be used, it says. Local authorities should receive a share of the gains from any development in their area.

According to the IoD, UK shale **production could peak at 1,121 billion cubic feet per year**, based on exploration companies' estimates of the size of recoverable resources. With **gas demand predicted to remain roughly flat** for the next two decades — it was 3,055 billion cu ft in 2011 — **shale could potentially meet about one-third of annual demand**. At that level of production it could help reduce import dependency from 76% to 37% cent in 2030.

The cost of net gas imports in 2030 could fall from £15.6 billion to £7.5 billion (at 2012 prices), the report says. At the same time, shale gas could generate significant tax revenues and make up for a decline in receipts from North Sea production.

The report argues that the surface impact of fracking is manageable and that the extensive use of water in the process should be put into context. Excluding tidal waters, the UK uses around 11,000 million cubic metres of water a year. According to the IoD, the use of water for shale gas could reach 5.4 million cubic metres a year - around 0.05% of the total. (May 23, 2013)

## GENERAL INFORMATION

### UNITED STATES: Environmental assessment - UG 79-12

#### Groundwater unaffected by shale gas production in Arkansas

A new study by scientists at Duke University and the U.S. Geological Survey (USGS) finds **no evidence of groundwater contamination from shale gas production in Arkansas**. "Our results show no discernible impairment of groundwater quality in areas associated with natural gas drilling and hydraulic fracturing in this region," said Avner Vengosh, professor of geochemistry and water quality at Duke's Nicholas School of the Environment.

The scientists sampled 127 shallow drinking water wells in areas overlying Fayetteville Shale gas production in north central Arkansas. They analyzed the samples for major and trace elements and hydrocarbons, and used isotopic tracers to identify the sources of possible contaminants. The researchers compared the chemical composition of the contaminants to those found in water and gas samples from nearby shale gas drilling sites. "Only a fraction of the groundwater samples we collected contained dissolved methane, mostly in low concentrations, and the isotopic fingerprint of the carbon in the methane in our samples was different from the

carbon in deep shale gas in all but two cases. This indicates that the methane was produced primarily by biological activity in the region's shallow aquifers and not from shale gas contamination," Vengosh said. "These findings demonstrate that shale gas development, **at least in this area, has been done without negatively impacting drinking water resources**," said Nathaniel R. Warner, lead author of the study.

Previous peer-reviewed studies by Duke scientists found direct evidence of methane contamination in drinking water wells near shale-gas drilling sites in the Marcellus Shale basin of north eastern Pennsylvania, as well as possible connectivity between deep brines and shallow aquifers, but no evidence of contamination from fracking fluids. "The hydrogeology of Arkansas's Fayetteville Shale basin is very different from Pennsylvania's Marcellus Shale," Vengosh noted. Far from contradicting the earlier studies, the Arkansas study "suggests that **variations in local and regional geology play major roles in determining the possible risk of groundwater impacts from shale gas development**. As such, they must be taken into consideration before drilling begins." Human factors -- such as the drilling techniques used and the integrity of the wellbores - also likely play a role in preventing, or

allowing, gas leakage from drilling sites to shallow aquifers. The take-home message is that regardless of the location, systematic monitoring

of geochemical and isotopic tracers is necessary for assessing possible groundwater contamination," Vengosh said. (May 16, 2013)

**WORLD: Market trends - UG 79-13**

**Shale boom sees cheap US coal head to Europe and Asia**

Lower gas prices have stimulated a pronounced switch to natural gas-powered electricity generation, provided a huge boost to the petrochemicals industry and the early steps of a switch to natural gas for transportation, but like a pebble dropping in a pond, the ripples from the shale gas revolution continue to spread outwards with consequences far beyond America's shores.

A recent note to investors by South Africa's Standard Bank explores one such consequence for the global thermal coal market, and as a result, for consumers of thermal coal around the world. The bank reports that cheap natural gas has seen it eat away at coal's pre-eminence as a feedstock in US electricity generation, yet US coal production has not fallen off to the same extent. As a result, this **displaced demand (more than 90% of US coal consumption is for electricity generation) has found its way onto international markets, particularly those of major importers Europe, China and Japan.**

With demand down in the depressed European market, traditional suppliers such as Russia, Colombia and South Africa have had to look elsewhere for markets, particularly the still-expanding Asia region. This is good news for electricity consumers in Europe and Asia, as lower coal prices mitigate electricity cost pressures from other fuel sources and help in some way to share the benefits of the US shale gas bonanza with the rest of the world, albeit at the expense of coal producers everywhere.

How much longer this will continue remains the subject of some debate, but with gas supplies plentiful in the US and the rising threat of carbon emissions legislation making a switch back to coal unlikely, **it would be surprising to see thermal coal prices rise anytime soon.**

In the medium term, low prices will stifle new mine investment. The bank estimates the **lowest breakeven cost for US coal miners is in the region of \$90/metric ton**, which, given the above, provides little incentive for investment in green-field projects and, at current price levels, might even see some marginal miners go out of business. (May 16, 2013)

**TIGHT GAS**

**PRODUCTION**

**PAKISTAN: Production start-up - UG 79-14**

**Pakistan's first tight gas expected soon**

Pakistan is expected to start producing **30 MMCFD of tight gas in July-August** this year from **Sajawal gas field** located in the district of Dadu, according to Business Recorder. This would be first time the country would be producing tight gas. Pakistan has estimate **tight gas reserves of about 40 TCF.**

The first ever tight gas **Sales and Purchase Agreement** was signed on November 13, 2012 in Islamabad for first production from a tight gas reservoir in Pakistan from Kirthar Block in Dadu, Business Recorder said. The Kirthar Block is jointly owned by Polish Oil and Gas Company (PGNiG) which has 70% stake and Pakistan Petroleum Limited owns 30%. If exploration and extraction is on schedule, Sui Southern Gas Company (SSGC) will receive 30MMCFD gas into its system through two Kirthar Block wells. For the implementation of this project, SSGC has been awarded a contract for the construction of 52-km pipeline. (May 14, 2013)

## GAS HYDRATES

### EXPLORATION – DISCOVERY

#### UNITED STATES: Reserves estimates - UG 79-15

##### **Expedition provides new Insight on gas hydrates in Gulf of Mexico**

A joint-federal-agency 15-day research expedition in the northern Gulf of Mexico yielded **innovative high-resolution seismic data and imagery** that will help refine characterizations of large methane hydrate resources in the U.S. Outer Continental Shelf. According to the U.S. Department of Energy's (DOE) Office of Fossil Energy (FE), the information will be used to **refine estimates of the nature, distribution and concentration of gas hydrate** in the vicinity of 2009 drill sites.

New data and imagery from the expedition, -planned by DOE, the U.S Geological Survey (USGS) and the Bureau of Ocean Energy Management (BOEM)-, will also help assess **how useful specialized seismic data may be to estimating hydrate saturations in deepwater sediments**.

"Over the past 8 years, research carried out under this program has resulted in significant advances in our understanding of methane hydrates, their role in nature, and their potential as a future energy resource. This success is largely due to an **unprecedented level of cooperation among federal agencies, industry, national laboratories, and academic institutions**." said Christopher Smith, Acting Assistant Secretary for Fossil Energy.

Using low-energy seismic sources, USGS scientists collected details about the nature of the gas hydrate reservoirs and about geologic features of the sediment between the reservoirs and the seafloor. The new data also provide information about how much gas hydrate exists in a much broader area than can be determined from standard industry seismic data, which is typically designed to image much deeper geologic units.

The data were collected at two locations in the Gulf of Mexico where the three federal agencies partnered with an industry consortium to conduct a drilling expedition in 2009. That expedition discovered gas hydrate filling between 50% and 90% of the available pore space between sediment grains in sandy layers in the subsurface. These reservoirs are **expected to be representative of the 6,700 trillion cubic feet of gas** that BOEM estimates is housed in gas hydrates in sand-rich reservoirs in the northern Gulf of Mexico.

In coming years, DOE, USGS, and BOEM will continue their collaborative investigation of gas hydrates in the northern Gulf of Mexico and other locations across the world. (May 14, 2013)

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