

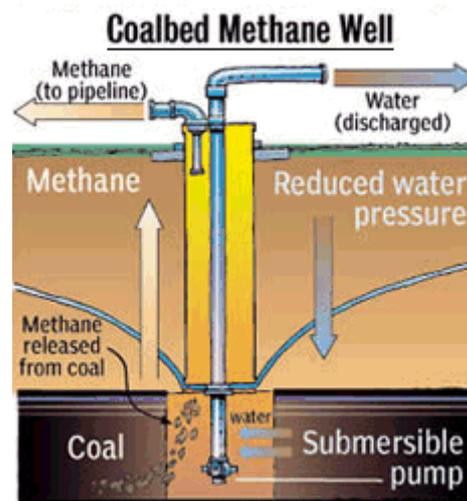
September 2013

# Briefing note

## Coal bed methane

While much of the media attention on unconventional gas in the UK has been focused on shale gas, coal bed methane is as great a problem, and a bigger threat in many areas. Historically, miners took canaries down coal mines to warn of the dangers of methane. Today, new warnings are needed for different reasons, including climate change and local environmental impacts.

Coal Bed Methane (CBM) is gas which is trapped in coal seams. To extract CBM, companies must 'de-water' the coal seam by drilling vertically and then horizontally (for up to 1 kilometre) and pumping out vast quantities of water that has been in contact with the coal for centuries. This releases the pressure in the coal seams, and allows the gas to flow. CBM extraction does not always involve fracking – at least not in the early years of an operation. But as gas flow starts to decline after a few years, wells are often fracked to increase productivity. In Australia where CBM (known there as coal seam gas) is more developed, the industry estimates that up to 40% of wells end up being fracked<sup>1</sup>.



### Where is the CBM threat?

Understandably the focus of attention for CBM firms is in the UK's former coalfields with licences in areas including West Yorkshire, South Yorkshire, Lancashire, Nottinghamshire, Derbyshire, Staffordshire, Kent, South Wales and the central belt of Scotland.

Among the key projects are:

- Dart Energy's proposal for a vast CBM project near Airth in central Scotland – this is highly controversial and has led to huge local opposition.
- IGas has recently announced plans to drill an exploratory well to investigate potential CBM resources at Barton in Greater Manchester.
- Coastal Oil & Gas plan to test for methane at three sites in East Kent

### How big are the UK's CBM resources?

The British Geological Survey has estimated that the total CBM resource in the UK is 2,900 billion cubic metres (bcm)<sup>2</sup>. This is approximately one-twelfth of its recent estimate for the shale gas resource in the Bowland Shale in northern England<sup>3</sup>. However the Government estimates that only maybe a tenth of this could be recovered, given resource conditions and planning constraints. This would be equivalent to just over three years' worth of current UK gas consumption<sup>4</sup>.

## **What are the problems with CBM?**

The key problems posed by CBM are the same as those of shale gas: its contribution to climate change and its local environmental impacts.

### **Climate change and energy policy**

Unconventional gas, such as CBM, is underpinning the Government's 'dash for gas', pinning our energy future on a continuing role for gas in generating electricity. According to the Committee on Climate Change, this dash for gas would be incompatible with meeting our mandatory carbon budgets<sup>5</sup>.

Globally, exploiting the world's reserves of unconventional gas could lead to a temperature rise of 3.5 degrees Centigrade<sup>6</sup>. This is way above the 2 degrees rise that the UK and other developed countries has said is necessary to avoid dangerous climate change. A recent report by Professor David Mackay, chief scientist at the Department for Energy & Climate Change, concluded that *"without global climate policies ... new fossil fuel exploitation is likely to lead to an increase in cumulative GHG emissions and the risk of climate change"*<sup>7</sup>.

### **Local environmental problems**

Although CBM extraction does not always involve fracking, the chemicals used in CBM drilling muds can be just as toxic as those used in fracking, and there are the same risks of spills and leakages. And because CBM is typically found at much shallower depths than shale gas (up to 1200 metres underground for CBM, compared to 2000 – 3000 metres for shale gas), risks such as groundwater contamination are increased.

CBM waste water is extremely salty and has been found to contain not only harmful chemicals from the drilling fluids used, but also highly toxic BTEX (benzene, toluene, ethylbenzene and xylenes) chemicals including known carcinogens, and naturally-occurring radioactive materials<sup>8</sup>. Spills and leaks of drilling fluids can also contaminate agricultural land and harm livestock.

Vast quantities of contaminated water must be treated and disposed of. Evidence is emerging from Australia that existing treatments cannot remove all the toxins found in CBM wastewater<sup>9</sup>. Extracting water from coal seams can also lead to depletion of groundwater<sup>10</sup>.

CBM would also have a significant impact on local landscapes: in addition to the tens or hundreds of wells, the infrastructure needed would also include access roads, water management facilities and pipelines to power stations.

### **Risks for human health**

Communities living near CBM extraction sites in Australia have complained of respiratory problems, rashes and irritated eyes<sup>11</sup>. But the long-term health impacts could be more severe: research from the USA has found that people living less than half a mile from unconventional gas wells have a higher excess lifetime risk for cancer, based on their exposure to air pollutants<sup>12</sup>.

The risks posed to the local environment and human health have contributed to the imposition of a ban in New South Wales on CBM extraction within 2km of residential areas<sup>13</sup>.

### **Energy bills and economic impacts**

Energy Secretary Ed Davey has said that UK shale gas production alone will not have any effect on UK gas prices<sup>14</sup>, and the same is true for CBM.

Supporters of unconventional gas claim great local economic benefits, but Dart estimates that their potentially vast Airth project would only create a maximum of 20 permanent jobs. Any economic

benefits of unconventional gas extraction are likely to be outweighed by the many disbenefits. Property developers Cala and Persimmon are understood to have objected to Dart's plans at Letham Moss near Airth because of the proximity to their developments and the possible impact on property prices, and Network Rail has objected, fearing that a gas blast could damage a nearby railway line<sup>15</sup>.

## Solutions

Friends of the Earth believes the answer to the UK's energy problems is not unconventional gas such as CBM, but cutting energy waste and developing clean British energy, using our vast potential for wind, wave and solar power<sup>16</sup>. This is also popular with the UK public: 85% of people want to see more energy produced from renewable sources and two-thirds said they wanted renewables to be providing more of their electricity in 10 years, compared to 2% for gas<sup>17</sup>.

For a full briefing on shale gas, please see [http://www.foe.co.uk/resource/briefings/shale\\_gas.pdf](http://www.foe.co.uk/resource/briefings/shale_gas.pdf)

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<sup>1</sup> Australian National Greenhouse Gas Accounts Coal Seam Gas Estimation and Reporting of Greenhouse Gas Emissions 2012, <http://www.climatechange.gov.au/sites/climatechange/files/files/climate-change/nger/nga-factsheet7.pdf>

<sup>2</sup> DECC 'The unconventional hydrocarbon resources of Britain's onshore basins – coalbed methane'

[https://www.og.decc.gov.uk/UKpromote/onshore\\_paper/Promote\\_UK\\_CBM.pdf](https://www.og.decc.gov.uk/UKpromote/onshore_paper/Promote_UK_CBM.pdf)

<sup>3</sup> DECC 'The Carboniferous Bowland Shale gas study: geology and resource estimation'

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/226874/BGS\\_DECC\\_BowlandShaleGasReport\\_MAIN\\_REPORT.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/226874/BGS_DECC_BowlandShaleGasReport_MAIN_REPORT.pdf)

<sup>4</sup> DECC 'The unconventional hydrocarbon resources of Britain's onshore basins – coalbed methane' *op cit*

<sup>5</sup> Guardian 4<sup>th</sup> December 2012 'Gas strategy should be plan Z government's official climate adviser warns'

<http://www.theguardian.com/environment/2012/dec/04/gas-strategy-plan-z-climate-adviser>

<sup>6</sup> International Energy Agency (2012) 'Golden Rules for a Golden Age of Gas'

[http://www.worldenergyoutlook.org/media/weowebiste/2012/goldenrules/WEO2012\\_GoldenRulesReport.pdf](http://www.worldenergyoutlook.org/media/weowebiste/2012/goldenrules/WEO2012_GoldenRulesReport.pdf)

<sup>7</sup> DECC 'Potential greenhouse gas emissions associated with shale gas extraction and use'

<https://www.gov.uk/government/publications/potential-greenhouse-gas-emissions-associated-with-shale-gas-production-and-use>

<sup>8</sup> National Toxics Network 'Toxic chemicals in the exploration and production of gas from unconventional sources'

[http://www.ntn.org.au/wp/wp-content/uploads/2013/04/UCgas\\_report-April-2013.pdf](http://www.ntn.org.au/wp/wp-content/uploads/2013/04/UCgas_report-April-2013.pdf)

<sup>9</sup> National Toxics Network submission to New South Wales Inquiry into Coal Seam Gas, September 2011,

<http://www.ntn.org.au/wp/wp-content/uploads/2011/11/NTN-submission-to-the-NSW-Inquiry-Into-Coal-Seam-Gas3.pdf>

<sup>10</sup> "The drawdown of ground water heads within coal seam gas aquifers is a necessary process and an unavoidable impact associated with the de-pressurisation of the coal" Groundwater (Deep Aquifer Modeling) for Santos GLNG Project – Environmental Impact Statement, 31/3/2009

<sup>11</sup> National Toxics Network 'Toxic chemicals in the exploration and production of gas from unconventional sources' *op cit*

<sup>12</sup> McKenzie et al Human health risk assessment of air emissions from development of unconventional natural gas resources

<http://cogcc.state.co.us/library/setbackstakeholdergroup/Presentations/Health%20Risk%20Assessment%20of%20Air%20Emissions%20From%20Unconventional%20Natural%20Gas%20-%20HMcKenzie2012.pdf>

<sup>13</sup> NSW Government 19<sup>th</sup> February 2013 'Tough new rules for coal seam gas activity'

[http://www.resources.nsw.gov.au/\\_data/assets/pdf\\_file/0008/458018/TOUGH-NEW-RULES-FOR-COAL-SEAM-GAS-ACTIVITY.pdf](http://www.resources.nsw.gov.au/_data/assets/pdf_file/0008/458018/TOUGH-NEW-RULES-FOR-COAL-SEAM-GAS-ACTIVITY.pdf)

<sup>14</sup> DECC Ed Davey speech 9<sup>th</sup> September 2013 'The myths and realities of shale gas exploration'

<https://www.gov.uk/government/speeches/the-myths-and-realities-of-shale-gas-exploration>

<sup>15</sup> The Herald 9<sup>th</sup> December 2012 'The dark side of the gas rush' <http://www.heraldscotland.com/news/home-news/the-dark-side-of-the-gas-rush.19626350>

<sup>16</sup> Friends of the Earth September 2012 A plan for Clean British Energy

[http://www.foe.co.uk/resource/briefings/plan\\_cbe\\_report.pdf](http://www.foe.co.uk/resource/briefings/plan_cbe_report.pdf)

<sup>17</sup> Friends of the Earth 23<sup>rd</sup> April 2012 '85% Brits back clean energy'

[http://www.foe.co.uk/news/85\\_per\\_cent\\_back\\_clean\\_british\\_energy\\_35609.html](http://www.foe.co.uk/news/85_per_cent_back_clean_british_energy_35609.html)