Friends of the Earth Scotland

Policy Briefing on

Unconventional gas & fracking

October 2012

Introduction

The industry predicts that unconventional energy sources such as coalbed methane and shale gas could meet our energy needs for years to come. Yet it is increasingly apparent that there are inherent risk associated with onshore unconventional gas extraction, as communities around the world link devastating environmental and health problems to nearby developments.

In Scotland the industry is moving rapidly from infancy to early commercialisation. Friends of the Earth Scotland is very concerned that developments are rolling out ahead of a proper review of the adequacy of the planning and environmental regulatory framework to deal with the new techniques used to extract coalbed methane and shale gas. It is essential that such a review, as well as a full life-cycle assessment of the environmental, climate and health impacts of the industry, is undertaken before it is allowed to develop any further.

Unconventional gas & fracking

As conventional gas sources dry up, the industry has been developing ways of extracting gas that is trapped inside rock formations – sometimes known as unconventional gas. The UK has potentially vast reserves of unconventional gas trapped inside shale rock and coal seams. In Scotland, the largest onshore unconventional gas reserves are coalbed methane found across the central belt, Fife and Scottish borders, with some shale deposits in the Forth Valley.

Hydraulic fracturing, or 'fracking', is a controversial technique often used to exploit unconventional sources of gas, such as shale gas and coal bed methane. It's an expensive process that is only economically viable when the price of fossil fuels is high. It involves drilling deep into the earth and pumping a mix of water, proppants and toxic chemicals under high pressure into the borehole to open up fractures and ease the flow of gas for extraction.

Environmental risks

There has been a great deal of focus in the media on the impacts of shale gas extraction and fracking, and there's a tendency to use these terms interchangeably, as shale gas drilling always involves fracking.

Coalbed methane extraction doesn't always involve fracking – at least not in the early years of a development. But as gas flow starts to decline after a few years, wells are often fracked to increase productivity. However, there are serious environmental problems associated with coalbed methane extraction regardless of whether fracking takes place.

Environmental risks fall into three key areas:

- **Water environment**

To extract methane gas the developer first needs to de-water the coal seam. This involves drilling vertically and horizontally (for up to 1km) into the seam and pumping out vast quantities of water that has been stewing in coal for centuries. Waste water from coalbed methane developments is very saline, and has been found to contain not only harmful chemicals from the drilling fluids used by operators, but also naturally occurring and highly toxic BTEX (benzene, toluene, ethylbenzene and xylene) chemicals amongst which are known carcinogens. Vast quantities of this contaminated water must be treated and disposed of. Evidence is emerging from Australia that existing treatments are not capable of removing all the toxins found in CBM wastewater.[1]

Drilling activities can also mobilise these chemicals and methane to leach into groundwater from the coal seam or the wellheads. A recent study found almost half the wells in one Australian CBM field to be leaking.[2]

- **Climate change**

Energy companies are keen to promote unconventional gas as 'natural gas', claiming that it is cleaner than conventional fossil fuels[3] and the obvious answer to our energy needs. However, unconventional gas extraction is considerably more energy intensive than conventional gas extraction, and the added risk of methane – a highly potent greenhouse gas – leakage means it is far from being a clean source of energy. In fact, research indicates that gas obtained through fracking could have a larger greenhouse gas footprint not only than conventional gas, but it could be as bad as, or worse than, coal - the dirtiest fossil fuel around.

The focus on unconventional gas extraction could also prove a serious distraction from badly needed investment in clean renewable energy and energy efficiency, and see us locked into expensive infrastructure for years to come.

[1]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
[2]Queensland Government Investigation Report 2010, Leakage testing of coal seam gas wells in the Tara 'rural residential estates' vicinity http://mines.industry.qld.gov.au/assets/petroleum-pdf/tara_leaking_well_investigation_report.pdf
[3]Dart Energy's recent planning application for wells at Letham Moss goes so far as to suggest that coalbed methane is not a fossil fuel.

- **Other impacts**

Like any industrial development, coalbed methane and shale projects have numerous local environmental and community impacts such as noise from drilling, site traffic and landscape impacts. There is also the risk of accidents and spillages of toxic drilling fluids, and air pollution. Extracting water from coal seams can also lead to the serious depletion of ground water,[4] and increases the risk of subsidence.

Hydraulic fracturing exacerbates all these risks.

Fracking is often introduced a few years in to a coalbed methane development as gas production begins to slow down. Where fracking is undertaken nearby communities face the additional risk of toxic chemicals from the fracking fluid seeping into local water tables, poisoning drinking water for humans and animals, and contaminating agricultural land. Some communities in the USA have seen their drinking water contaminated by methane and chemicals in this way, and there is evidence of leaks and spillages leading to the death of pets and farm animals. Fracking is also known to cause earth tremors that – while unlikely to be felt by people – can cause damage to boreholes and wellheads thereby increasing the risk of methane and chemical leaks.

- **Multiplier effect**

Moreover, each coalbed methane and shale development requires tens or even hundreds of wells by the time it reaches the commercial stage, so the cumulative local environmental impacts for each project can be very significant. It also means that the likelihood of something going wrong – such as a well blow out or chemical spillage – is considerably greater. This is known as the 'multiplier effect'.

What's happening in Scotland

There are currently a number of areas in Scotland licensed for onshore oil and gas exploration and development. The two most advanced are outlined briefly here:

- **Forth Valley**

The most advanced unconventional gas development is at Letham Moss, near Airth, where Dart Energy is using horizontal and vertical drilling techniques (but not currently fracking) to extract coalbed methane. This pilot project is Dart's most advanced European venture, and produced its first electricity from the site earlier this year. Still at the testing stage, the project already has 14 wells drilled.

In September 2012 Dart submitted planning applications to Falkirk and Stirling Councils for 14 new wells, a waste water treatment facility and a network of pipelines to take the development to its commercial production phase. However, this second phase of the project will access less than 20% of the resource in the license area which Dart plans to exploit in coming years.[5] Simple maths indicates that the area could see at least a further 50 wells in the coming years if Dart's plans go ahead.

- **Dumfries & Galloway**

The second most advanced project is at a Canonbie, near the Scottish Border, and is also operated by Dart Energy (who bought out Greenpark Energy's license in early 2012). Again, while still in the testing stage, over 19 wells have been drilled. The company has permission from SEPA to frack for coalbed methane at this development, however the development appears to have stalled, possibly as Dart focuses attention on its Letham Moss project.

This development has highlighted a worrying loophole whereby companies exploiting coalbed methane can apply to SEPA for permission to frack after planning permission has been granted meaning that there is no opportunity for the local authority or community to be properly consulted on the use of the technique in their area.

- **Rest of Scotland**

Large areas of Lanarkshire and Fife are also currently under license and being explored for unconventional gas. In early 2013 the UK Department for Energy and Climate Change (DECC) will launch the tendering process for its 14th round of onshore licensing during which a vast swathe of central Scotland will be put out to tender for gas and oil exploration.

Friends of the Earth Scotland's position

We are extremely concerned about a number of planning and regulatory loopholes that mean unconventional gas operators can in many circumstances avoid Environmental Impacts Assessment, and avoid community and local authority consultation if they wish to undertake fracking.

We are also clear that even if it was safe to extract this gas (and it is increasingly clear that it is not) it isn't safe to burn it. Investing in unconventional gas now will lock us into to dangerously high greenhouse gas emissions and make it extremely difficult to meet our world leading, legally binding carbon reduction targets in 2050.

Friends of the Earth Scotland is calling on the Scottish and UK Governments to suspend all ongoing unconventional gas activities, and put in place a moratorium on any new projects, until these problems are fully addressed.

For more information contact:

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[4]"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

[5] http://www.naturalgaseurope.com/dart-announces-first-cbm-electricity