

### Introduction

You've probably come across the word fracking in the news recently and wondered if the reality is as ugly as the word. Maybe you've heard about a new natural gas boom and wondered what shale gas and coalbed methane mean for our energy needs.

There is a growing body of evidence from the USA, where the unconventional gas industry is far more developed, that there are inherent and unacceptably high environmental and health risks associated with coalbed methane and shale gas extraction.

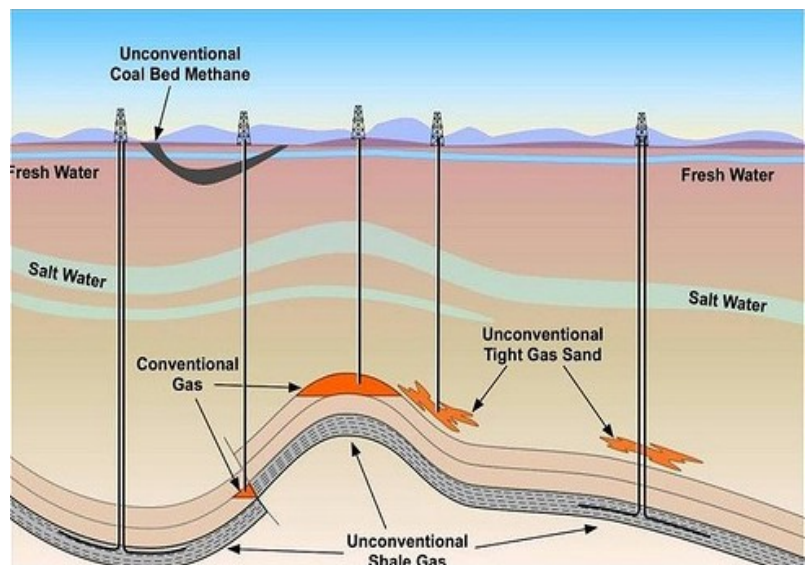
However there hasn't been a proper assessment of the environmental, climate and health risks associated with the unconventional gas industry, nor of public acceptability of these developments, in the UK.

Friends of the Earth Scotland think it's essential that a broad, whole life-cycle assessment is undertaken before the industry is allowed to develop further. In this briefing we outline some of the key risks associated with the unconventional gas industry; what's happening across Scotland; and what activists and communities can do about it.

### Unconventional gas & fracking

Natural gas is a fossil fuel that is produced through the decomposition and heating of organic matter over many hundreds of thousands of years. Conventional gas extraction involves drilling vertically through rock formations into gas pockets, from which the gas rises through the borehole and is captured at the wellhead.

However, as these convenient and relatively easily accessed pockets dry up, the industry has been developing ways of extracting gas that is trapped inside the 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 industry has its eye on coalbed methane reserves across the central belt, as well as a large shale deposit 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 bore hole to open up fractures and ease the flow of gas for extraction.

### Environmental risks

The recent media focus has been 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 into our natural waterways. Evidence is emerging from Australia that existing treatments remove only about half the toxins found in CBM wastewater.

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.

- **Climate change**

Energy companies like to promote unconventional gas as ‘natural gas’, claiming that it is cleaner than conventional fossil fuels and the obvious answer to our energy needs. However, unconventional gas extraction is 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 than not only conventional gas but as bad as, or worse than, coal which is 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.

- **Other impacts**

Like any industrial development, coalbed methane and shale developments 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, and increases the risk of subsidence.

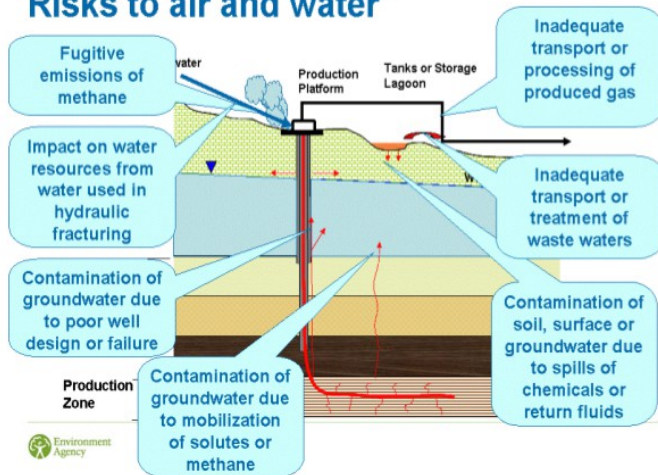
**...fracking simply exacerbates all these risks...**

Fracking is often introduced a few years in to a coalbed methane development as gas flow – initially triggered by de-watering the seams – begins to slow down. Where fracking is undertaken there is 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 being 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 potential 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’.

**Risks to air and water**



## What's happening in Scotland?

There are currently a number of areas in Scotland licensed for onshore oil and gas exploration and development. These are outlined below.

- **Forth Valley**

The most advanced unconventional gas development is at Letham Moss, near Airth, where a company called 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. Simple maths indicates that the area could see at least a further 50 wells if Dart's plans succeed.

- **Dumfries & Galloway**

The second most advanced project is at a Canonbie, near the Scottish Border, and is also operated by Dart Energy (who recently bought out Greenpark Energy's license at this site). 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.

- **Lanarkshire**

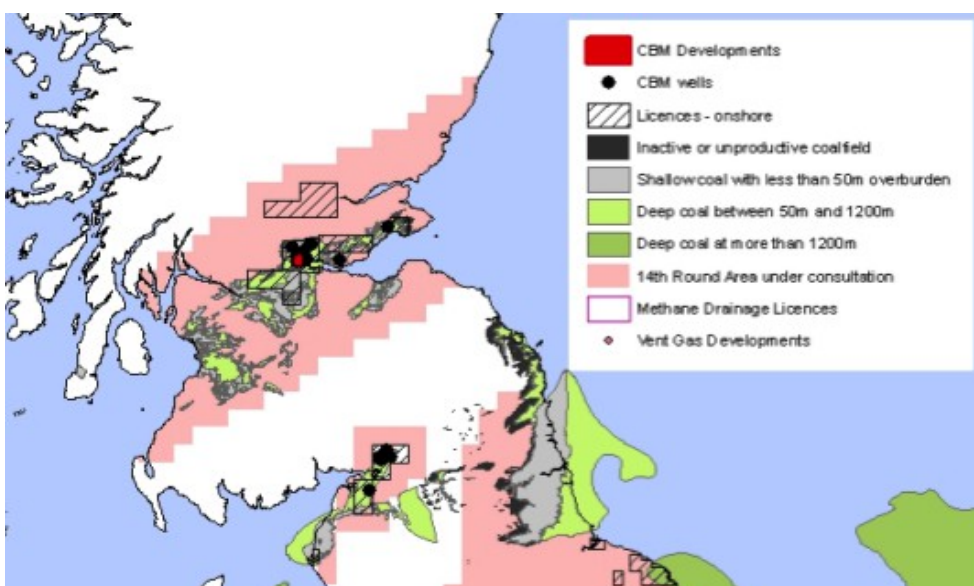
A third company – Reach Coal Seam Gas – is hoping to develop coalbed methane in North Lanarkshire, where it has a license to explore a large area. However, the company recently withdrew a planning application for a development at Moodiesburn, following significant public opposition.

- **Fife**

Dart Energy also has a further two licenses to explore large areas in Fife and the Midland Valley, and are hoping to exploit shale reserves in the Lothian and Black Metal Shale.

...and there's more to come...

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. The area DECC are seeking to licenses is marked in pink on the map below. Existing licensed areas are outlined in black with horizontal lines.



## Friends of the Earth Scotland's position

Our climate is changing due to human made greenhouse gas emissions, caused largely by burning fossil fuels. No scientific body of national or international standing disputes this, and an increase in global temperatures is already causing extreme weather around the world, impacting on the poorest and most vulnerable communities.

In order to prevent the worst impacts of climate change, we need to stop burning fossil fuels as soon as possible, reduce our energy use and invest in renewable energy.

The crucial point is 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 legally binding carbon reduction targets in 2050.

That's why 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 the problems outlined in this briefing are adequately addressed.

## What you can do about it

- **Object to developments in your area**

If you live in one of the areas described above, keep your eye out for planning applications relating to coalbed methane and shale gas developments. There's strength in numbers so encourage your neighbours to engage too when an application arises.

- **Write to your Councillors**

If you live in a local authority area that falls into one of the unconventional gas licensed areas you could write to your Councillors to let them know your concerns.

This can be particularly effective if you write before a planning application is considered because Councillors can call a planning application in to re-examine it – but you as a third party can't!

- **Write to your MSPs, MP and MEPs**

It's their job to represent you in Holyrood, Westminster and Brussels so draw their attention to the issue and let them know that you are concerned.

Issues you may wish to raise include problems with loopholes in environmental and planning regulations, and the lack of a full lifecycle analysis of the environmental, climate and health impacts of the industry.

- **Get together with your neighbours and declare your community a CBM free zone!**



Some towns in the Australia, the USA and across Europe have declared themselves 'CBM & shale free zones'. This is a smart way of pre-empting plans for unconventional gas, and warning potential developers that many local people will object to applications in the area.

Opposing unconventional gas in your area will be much easier if you join together with others in your area. You can plan activities together, make use of everyone's skills and contacts, and send a clear message to gas exploration companies that they are not welcome in your area.

## Find out more

To find out more and access resources to help you to object to developments, contact your representatives and work towards becoming a CBM & shale free zone, visit [www.frackfreescotland.org.uk](http://www.frackfreescotland.org.uk)

Get in touch with us at [mchurch@foe-scotland.org.uk](mailto:mchurch@foe-scotland.org.uk)

