Shale gas & coalbed methane

Friends of the Earth Scotland Supporter Briefing

September 2016

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

As conventional oil and gas sources run out, and the cost of extraction rises, we are in the middle of a big push to exploit fossil fuels by ever more extreme means. However, not only does climate science demand that we leave these fossil fuels in the ground, there is a growing body of evidence from the USA and Australia, where these industries are more developed, that there are inherent and unacceptably high environmental and health risks associated with shale gas and coalbed methane extraction.

What is unconventional gas?

Shale gas is a form of gas trapped inside shale rock, while coalbed methane is trapped inside coal seams. They are known as 'unconventional' because of the novel techniques - like fracking - used to extract the gas.

Hydraulic fracturing, or 'fracking', is a controversial technique often used to exploit unconventional sources of gas, such as shale gas and coalbed methane. It is an expensive process that is only economically viable when the price of fossil fuels are high. It involves drilling to depths of around 3km and pumping millions of litres of water and toxic chemicals under high pressure into the borehole to open up fractures and ease the flow of shale gas for extraction.

Unlike shale gas fracking, coalbed methane extraction doesn't always involve fracking – at least not in the early years of a development. Instead, coal seams are de-pressurised by pumping out large volumes of water in order to extract the methane gas. But as gas flow starts to decline after a few years, wells are often fracked to increase productivity. In Australia the industry estimates that up to 40% of coalbed methane wells end up being fracked.

Health and environmental risks

Chemicals that can be highly toxic to the environment and human health are used in both drilling muds and fracking fluids. Different chemicals are used for different fracking operations, making it difficult to predict exactly what kind of chemicals might be used if fracking went ahead in Scotland.

In addition to this, drilling and fracking processes can mobilise harmful chemicals and radioactive substances naturally occurring in the coal and shale, which can contaminate groundwater and soil, and leak into the atmosphere with consequences for public health and the climate. Conservative estimates put well failure on newly drilled wells – which can result in leakage of methane and toxins into air and water – at between 5-9%, and at upwards of 50% during their lifespan.

Communities in the USA and Australia living in and around gas fields report symptoms associated with exposure to fracking and drilling chemicals, including respiratory problems, nausea and rashes. Many of the naturally occurring and introduced chemicals are known carcinogens. Several chemicals used in fracking are hormone-disruptors that affect the sensitive control systems in our bodies that can lead to negative impacts on reproduction, neurodevelopment, behaviour and metabolism. A growing body of research points to serious longer-term impacts such as low birth weights and birth defects. Researchers in the USA recording the extreme impacts of accidental exposure of farm animals and pets to concentrated fracking fluids warn that the industry is a public health disaster waiting to happen.

There is a serious unanswered question around the disposal of the huge volumes of waste fluids the industries would produce. During its life span, a single shale gas well consumes between 19-30 million litres of water. Multiplied by potentially thousands of wells and that's an awful lot of water. Once contaminated with naturally occurring and introduced chemicals, the 'wastewater' must be treated and disposed of. Disposal methods in the USA and Australia include spreading on roads for dust suppression, holding in evaporation ponds and re-injecting into gas wells. The first two are linked to serious public health risks, and the latter to induced seismic activity. In Oklahoma, re-injection of waste fluids has been linked to the state experiencing 1000 years' worth of earthquakes in just 2 years. While spreading on roads and evaporation ponds are likely to be prohibited in Scotland under EU legislation, regulators south of the border have been accused of paving the way to permit re-injection of waste fluids.

Many of these risks apply to coalbed methane whether or not fracking takes place. In fact, because coalbed methane is significantly shallower than shale rock certain risks, such as groundwater contamination, are increased, and fracking simply exacerbates these impacts. Research from the USA demonstrates that air pollution around gas pads is higher during drilling stages than fracking stages.

Climate change

Even if it was safe to extract this gas (and it is increasingly clear that it isn't), if we want to prevent the worst impacts of climate change it isn't safe to burn it. We already have over 5 times more fossil fuels reserves than we can safely burn, so it doesn't make sense to waste time and resources recklessly pursing even more. Investing in unconventional gas now will lock us into dangerously high greenhouse gas emissions and make it extremely difficult to meet our legally binding carbon reduction targets in 2050.

The main uses of natural gas are in electricity generation and for heating. In both areas Scottish Government policy is moving away from the use of all fossil fuels, leaving little or no market for unconventional gas in the future. Scotland has an abundance of renewable energy resources: 25% of Europe's offshore wind and tidal potential and 10% of its wave potential. Not only is the Scottish Government on track to meet its 100% renewable electricity consumption by 2020 target, but independent research demonstrates that Scotland could meet all our electricity needs from renewable sources and phase out fossil fuel generation by 2030 and have excess to export.

Frackonomics

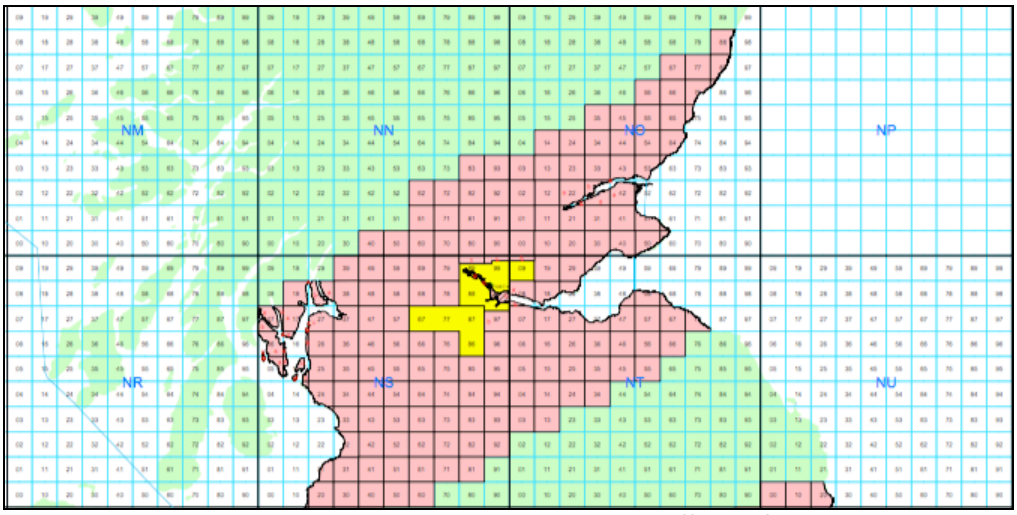
Not even the shale gas industry itself claims that fracking will bring down household energy bills in the UK anymore (although some politicians cling to the belief it will!). Job figures tend to be overstated, and fail to include the negative impact on local industries such as tourism and agriculture. Even if there were no health and environmental concerns, economists and geologists agree that the UK would not see a repeat of the USA experience in terms of production as our complex geology and dense population make extraction much more challenging and expensive.

The renewables industry in Scotland is very valuable to the economy, providing over 21,000 jobs in 2013, and many thousands more in the pipeline. However, the International Energy Agency and other leading commentators such as Deutsche Bank warn that a dash for unconventional gas could prove a serious distraction from badly needed investment in clean renewable energy and energy efficiency, and lock us into expensive, carbon-intensive infrastructure for years to come.

Who wants to frack Scotland?

The fight against unconventional gas in Scotland began when a company called Dart Energy applied for planning permission to develop the UK's most advanced coalbed methane project at Airth, near Falkirk. The project attracted huge local opposition and went to a public inquiry. Before a decision could be made, the Scottish Government announced a moratorium on both shale gas and coalbed methane, so the project is currently on hold. Coalbed methane projects in Canonbie, Dumfries and Galloway, and Deerdykes, North Lanarkshire were also underway before the moratorium was announced.

In summer 2014 multinational chemicals company INEOS acquired its first stakes in onshore oil and gas licenses in the Central Belt of Scotland. INEOS now owns or has a majority stake in all onshore oil and gas licenses in the central belt of Scotland, having acquired 80% equity in PEDL 162, and ownership of PEDL 133, covering an area of over 700km^2. The company also has a number of licenses in England, and is currently shipping ethane from fracked US shale gas to its petrochemical plant at Grangemouth.



Areas currently under license in yellow, and areas offered for license under 14th UK onshore licensing round in pink. No new licenses were granted in Scotland during the 14th round because of the ongoing moratorium. Source: DECC

The global anti-fracking movement

People around the world and here in Scotland faced with the unconventional fossil fuel industry are increasingly aware of its dangers and are resisting its advance. Communities at Airth, Canonbie and Cumbernauld have been fighting coalbed methane developments, while people the length and breadth of Scotland successfully opposed UK Government plans to license a huge swathe of central and southern Scotland to the fracking industry, and persuaded the Scottish Government to introduce a moratorium.

France was the first country in Europe to ban hydraulic fracturing and other countries and states have followed suit with moratoriums and bans. In New South Wales the Government has introduced 2km buffer zones between communities and coalbed methane drilling in response to the widespread 'Lock the Gate' coalition.

Bans, moratoriums and restrictions are now in place in: Scotland; Wales; Northern Ireland; Denmark; Germany; Bulgaria; Czech Republic; the Netherlands; the Spanish regions of Cantabria, La Rioja, Navarra and Catalonia; the Flemish region of Belgium; Canadian states of Quebec, New Brunswick, Nova Scotia. Newfoundland and Labrador; Vermont, New York, New Jersey and Maryland in the USA; New South Wales and Victoria in Australia; as well as a huge number of local and regional bans abound the world.

Our campaign

In January 2015 four years of campaigning alongside grassroots and communities paid off when the Scottish Government announced a moratorium on shale gas and coalbed methane! And in October 2016, a ban was placed on underground coal gasification, the third type of risky unconventional energy extraction threatening Scotland (see separate briefing for more on UCG).

Now our job is to turn the moratorium on fracking and coalbed methane into a ban alongside UCG. The Scottish Government is currently reviewing the evidence on fracking and coalbed methane, including the public health, climate change, seismic and economic impacts (see separate briefing 'What's going on with this fracking moratorium?'). In winter 2016 / 2017, there will be a public consultation where everyone in Scotland will have the chance to express their views on whether shale gas fracking and coalbed methane drilling should go ahead in Scotland.

We are convinced that a full and thorough assessment of the impacts of the industry, as well as the widespread opposition to fracking across Scotland, will convince the Scottish Government to put a full ban in place. But the industry will be gearing up with the opposite aim in mind. It's very important that the public momentum behind this campaign doesn't stall at this crucial stage. We need to keep the pressure up to ensure a robust assessment is carried out, and that the public consultation receives huge numbers of responses.

What you can do

- respond to the consultation when it is published. If you are short of time sign an online petition. Even better, send a personal response by email or post.
- get the word out to friends, family and colleagues and encourage them to respond too
- organise a street stall, public meeting or film screening in your area to inform and engage people and enable them to respond to the consultation too
- go along to your local community council meeting[1], tell them how you feel about fracking and encourage them to reach out for the views of local people and respond to the consultation
- write to your local councillors to tell them how you feel about fracking and ask them to take a stance – with an election coming up next spring they'll want to know they can count on your vote… [2]
- make sure your MSPs also know how you feel by writing to them or dropping into a surgery
- it's possible that the Government will organise community meetings and events that you can get involved in

and don't forget to:

- join FoES' email list to keep informed about the consultation and for resources to help with your response and activities in your local area
- find a group fighting fracking near you and get involved![3]

For more info: www.foe-scotland.org.uk/fracking
To join FoES email list contact: mchurch@foescotland.org.uk

Friends of the Earth Scotland's work on unconventional fossil fuels is part of our campaign for a Fossil Free Scotland: A just transition to a 100% renewable, nuclear-free, zero-fossil-fuel Scotland

find out more at: www.fossilfree.scot

[1] If you are not sure who your community council is, or how to get in touch, visit: http://www.communitycouncils.scot/community-council-finder.html
[2] This helpful website uses a postcode search to find your local councilors, MSPs and MPs and lets you write your own email to all of them https://www.writetothem.com/
[3] Frack Off have a list of local groups in Scotland including contact details: http://frack-off.org.uk/local-group-specific-pages/#anchor-11