Frack Free Balcombe
Residents Association

Community Evidence to the Lords Select Committee on the Economic Impact on UK Energy Policy of Shale Gas and Oil

Balcombe, January 21st, 2014

The rational anti-fracking movement of Balcombe

Some politicians label us 'irrational'. But we in Balcombe have been soberly studying fracking for the past two years, sometimes to the exclusion of our day jobs. We have attended conferences and debates, established links with academics and engineers, corresponded with councils, MPs and government agencies, and sat in on your sessions, wishing we could give our own evidence in person. Our concerns are based on solid research, on peer-reviewed science, on our experience of Cuadrilla operating in our village, and on personal contact with North Americans and Australians whose land and lives have been severely damaged by this industry. We are teachers and academics, plumbers, accountants, joiners, journalists, artists, farmers, engineers, lawyers…

Balcombe village polls have shown over 80% of our community to be against Cuadrilla. The company has no social licence to be in our village.

Balcombe – a sacrificial guinea pig

In mid-January, 2014, Nick Boles (Planning Minister) said at the All Parliamentary Group on Unconventional Gas and Oil: 'Every energy source brings social costs. We have to balance national needs with community needs. Individual communities cannot be allowed a veto.' But no attention is being paid to our needs. We are guinea-pigs in a dangerous experiment being promoted by the government.

Balcombe and beyond

The views we hold here are spreading rapidly across the country. Groups opposed to fracking are springing up and sharing their research. We and community groups from Lancashire are now seeing the rest of Britain waking up and reacting. Every time a new planning application is mooted, or a new licence application is made, a new community protest group emerges.

Our environment and health are not for sale

The Government are now losing the argument. Fracking must be bad if they and the industry need to bribe us! Communities will not accept sweeteners. The potential costs to our health, environment and livelihood are too great.

The money would not go very far in any case. US road-mending statistics show that costs of improving and repairing roads typically exceed any compensation. Arkansas received $182m

compensation from shale gas since 2009 but had to spend $450m on roads. Pennsylvania received $1.3billion in 2012 but spent $7billion. Locals comment that the incentive seemed to suffice, nevertheless, to corrupt the planning process.

Why fracking makes no economic sense

Time is against the fracking industry – and this is the strongest economic argument. Analysts agree that shale gas would not come seriously on tap until the mid-2020s at very earliest - just when we are committed to being well on our way out of fossil fuels. Shale gas and all its new infrastructure will be stranded assets. The claim that greenhouse gas emissions from shale gas and other fossil fuels will be dealt with by carbon capture and storage (CCS) is hollow. Britain has already fallen years behind timetable on CCS and it is unlikely that CCS will ever work safely or at a cost we can afford.

Already there are indications in the US that shale reserves have been overvalued, and that prices do not cover costs. The German newspaper, Süddeutsche Zeitung, on January 9th 2014 reported:

'Investment in shale gas halved in the US in 2013 compared with 2012 (figures from consultants IHS Herold). Oil and gas companies and their investors spent more money on land, equipment and exploration than they earned from sales of gas and oil. Less capital outlay means fewer wells drilled and lower production – and that could spell the end of the era of low energy prices. The bubble will burst. "I wouldn't be surprised if it burst this year," says Werner Zittel, chief executive of independent analysts the Ludwig-Bölkow Foundation.'

The US Energy Information Administration (EIA) is no more encouraging where we are concerned: 'Compared with North America, the shale geology of the UK is considerably more complex, while drilling and completion costs for shale wells are substantially higher… faults are numerous, geologic data control is weak, and shale wells are more costly to drill.'

How much shale gas will cost to extract in the UK is still anyone's guess. Bloomberg comes up with its own estimate, that UK costs will be 40% to 100% more than in the USA. The International Energy Agency (IEA) and Ernst & Young also predict higher costs than in the USA, and costs that will be higher than those of conventional gas development in Britain. If that is the case, UK shale gas operations could be loss-making. Where will our 1% community cut be then? Gone, along with the taxes the government hopes to raise.

Whatever the production costs, gas prices will not drop this side of the Atlantic for industry and hard-working families. Virtually all the experts are now agreed on this, but the government still repeats this myth. We are part of the European regional gas market, and any local extraction will have minimal impact. When Lord Browne (chair of Cuadrilla, former chair of BP and lead 'non-executive' across government) declared in a speech at the LSE in late 2013 that shale gas would not mean lower prices in the UK, the Government story briefly wavered – no, John Redwood explained, prices wouldn't drop, but the Government would use all those shale gas taxes to subsidise prices (Spectator debate, Dec 2013). Days later, the Prime Minister was back to 'lower prices'. Does he think our memories are so short?

We should not ignore longer-term costs. Wells once drilled will be there forever. But there is powerful evidence from the USA that around half of all wells will fail or leak within a few years. How long will Cuadrilla's insurance be valid? Even now, we worry. The latest available accounts show the current net worth of the Cuadrilla subsidiary Cuadrilla Balcombe Ltd to be a negative number, -£401,689 (http://companycheck.co.uk/company/06811588).

Meanwhile, job figures have been hyped. A Cuadrilla-sponsored study based on off-shore statistics promised 74,000 jobs, but DECC and Amec later predicted a maximum of 32,000. Most will be specialised, few for locals. Yet government and industry still quote Cuadrilla's figure.

Industrialisation of the British countryside

The pursuit of gas locked in shale and coal will, as US Energy Secretary Ernest Moniz confirmed in January 2014, 'result in unavoidable changes to the countryside'. We are threatened with thousands of wells. In the long term, Bloomberg estimate there will be 10,000 wells radiating from 1,000 pads, with 1,000 new wells added per year at peak production. AMEC's report suggests a possible 2,880 wells on 120 pads. All this will require hundreds of new access roads, many pipe networks, plus compressor stations, dehydrators and power stations.

Oil or gas flow declines sharply in shale wells, possibly by 70% over the first year. New sections of wells must be fracked, or new wells drilled and fracked, to keep up the flow. That spells years of disruption for communities, heavy traffic, growing health and environmental concerns. Jobs will be lost in tourism, small businesses and the hospitality industry, and farming impacted. In Balcombe, within an Area of Outstanding Natural Beauty, Cuadrilla has signed a 30-year lease.

The UK's inadequate on-shore regulation

Our aim is a ban on fracking, nationwide. We have come to believe that adequate regulation is impossible for on-shore shale gas exploration. Our experience in Balcombe has been that government agencies and advisors are inexperienced and naïve. They cannot even provide us with remotely similar definitions of fracking.

The Environment Agency (EA) is increasingly understaffed and underfinanced. It has clearly not made any real attempt to assess the case we made objecting to Cuadrilla's mining waste application for Balcombe. Nearly 900 objections were lodged within the prescribed timeframe. Yet only three days after the final date for submission the EA issued a permit.

Last summer, Cuadrilla were allowed to self-monitor, self-report, and self-regulate. We know of only one inspection visit by the EA that was not made at our request. Cuadrilla were permitted simply to monitor their own operations, and to send an email to the relevant authorities each Friday afternoon to assure them that all was well. That seriously undermines the government's repeated claim that our UK environmental regulation is 'robust'. The Chartered Institution of Water and Environmental Management (CIWEM, Jan 2014) has issued its own warning. 'It is important that the public are reassured that this regulation is fit for purpose and that transparency is displayed on all levels in order to establish trust. There appears to be scope for improvement on these fronts at the present time. Whilst a profitable shale gas industry may be attractive to the Treasury, this must not be achieved via light touch regulation at the expense of critical environmental resources.'

The government is now caught in a conflict between its reassurances about what it claims is a 'robust regulatory regime' and its promise to industry of 'clear, streamlined regulations'. To us, 'streamlined' carries the implication that dissenting voices will be ignored and that evidence pointing to dangers of grave environmental damage will be sidelined. Years of legislation protecting peoples' health and environmental safety will also be sidelined. Such weak regulation will have little or no chance of preventing the kind of well-documented accidents, toxic spills and water pollution that have blighted homes and farms in numerous American states. UK ministers, when asked about such pollution, have relied on bland and blanket reassurances from

senior US officials. America's notoriously weak and pliant Environment Protection Agency has already suspended its own investigations into water pollution attributed to shale gas development in three states, to the reported dismay of some of its own staff.

Cuadrilla's poor performance

In Lancashire, because of inadequate seismic testing, Cuadrilla fracked into a fault near Preese Hall, and caused earthquakes that damaged their well casing over several hundred feet. Damaged well casings are the main conduit for contaminants from oil and gas wells. Yet they continued to frack this well, and they informed the authorities only six months later. At their Anna's Road site they flagrantly continued drilling two weeks beyond the permit period, despite the arrival of protected overwintering birds.

In Balcombe, Cuadrilla failed to apply for permits for mining waste and naturally occurring radioactive materials. During drilling, they exceeded noise limits, disturbing our sleep. We had to buy our own sound testing equipment before they admitted infringing the limits. Villagers were plagued by heavy traffic, sometimes outside agreed hours. Cuadrilla lorries passed the school at drop-off/pick-up times, sometimes faster than agreed, sometimes with no labels to show if their contents were toxic.

Base line testing of air and water has been shown to be vital in North America and Australia, when it comes to proving cases of pollution. As a community, we looked into doing our own, but quickly discovered this would be extremely expensive. Cuadrilla sub-contracted testing to Ground Gas Solutions. We question whether their air and water testing has been at adequate distances in time and space, and whether they tested for the right chemicals. We know that Cuadrilla accidentally removed upwind air sampling stations when they took down fencing. Another set of air sampling devices, also within the compound, were tampered with at the pre drilling-stage. Of five surface water monitoring points, only the two furthest from the site had results for the post-drilling report. So we believe the quality of Cuadrilla's baseline information is poor, and both they and their sub-contractors have been reluctant to share it with us. http://www.cuadrillaresources.com/wp-content/uploads/2013/11/Drill-Phase.pdf.

Neither Cuadrilla nor West Sussex County Council appear to have plans for dealing with accidents and emergencies, other than calling the ordinary emergency services. Emergency plans do not feature in planning applications.

Cuadrilla's engagement with our community has been lamentable – there was indeed no communication for the first 18 months until we invited them to a public meeting. When trying to raise issues with them we are directed to a public relations company, and it can take two weeks to receive what is usually an inadequate reply.

Unhealthy relationships, misinformation

Two years ago, many of us in Balcombe were politically naïve. Now we have been made aware of the power of oil and gas industry money to influence the democratic process. Our concerns include the funding of all party parliamentary groups at Westminster, industry funding for research projects (including a study released by the Institute of Directors) and conflicts of interest within government departments, where industry or ex-industry executives are advisors.

We have learned that planning staff at West Sussex County Council have been trained by industry members in how to process planning applications. Our parish council has held what we

see as cosy meetings with Cuadrilla. Responses to our concerns from council officials, ministers, and the Prime Minister's office have usually been dismissive. We feel unrepresented.

High volume hydraulic fracturing is new

This kind of fracking is new. Conventional, vertical wells have been low-volume-fracked since the 40s. High-volume fracking in long, horizontal wells was developed in the USA little more than a decade ago.

Modern fracking has happened only once in the UK. The Department of Energy and Climate Change (DECC) confirmed this in an email to Balcombe residents on August 20th, 2013: 'Cuadrilla is the only operator in the UK to so far use high volume hydraulic fracturing – this technique was used on the Preese Hall well in Lancashire in 2011. DECC has not at this stage received any applications from other operators to carry out hydraulic fracturing for shale gas onshore in the UK and therefore no such consents have been issued.'

For engineer and fracking expert Mike Hill, comparing old fracking to modern fracking is like comparing a corner shop to a hypermarket. It's a question of scale – modern fracking uses higher pressures, more water, more chemicals. Yet the 'fact' that fracking has been going on since the 1940s has been used by government and industry in an attempt to sooth and silence opposition.

Fugitive methane could make shale gas worse than coal

Peer-reviewed scientific papers published recently in the USA provide powerful evidence of extremely high levels of methane emissions in the air around gas sites. Principal amongst them is a study from the University of Harvard in collaboration with four other top academic bodies and a federal agency, the US National Oceanic and Atmospheric Administration. Further studies from Austin, Texas, Colorado and Cornell University put losses to the atmosphere from venting and leaks at up to 8% of all the shale gas they get out of the rocks.
http://link.springer.com/article/10.1007/s10584-011-0061-5#page-2

Levels this high would undermine any claims that shale gas could result in lower greenhouse gas emissions if gas were to replace coal. (There is no guarantee than gas will be used instead of rather than as well as coal.) Burning methane produces less CO_2 than coal, but methane escaping unburnt to the atmosphere is 86 times more potent a greenhouse gas than carbon dioxide over a 20 year time scale, and about 35 times more potent even over 100 years, according to latest figures from the Intergovernmental Panel on Climate Change (IPCC).

Such evidence threatens the main justification for shale gas development, namely that it is a useful 'transitional' fuel that can quickly lower greenhouse gas emissions in the short to medium term, while investment takes place to build up low carbon generation from renewables. The growing US evidence on fugitive methane emissions was completely ignored in a recent paper on shale gas and the greenhouse effect, co-authored by the DECC chief scientific advisor.

Fracking waste – why it is 'nasty stuff'

We in Balcombe are opposed to any drilling, testing and oil or gas extraction, conventional or unconventional, so close to our village. In Australia, legislation now prohibits oil or gas wells closer than 2km from houses and schools. The Balcombe school is 1.5km from Cuadrilla's well, while some houses are 600m downwind. Drilling muds, vented methane and air-borne pollution from the flare are all concerns for local health and environment, even before we get to fracking.

Lord Lipsey asked a recent community panel of witnesses from Lancashire at the EAC to say why fracking fluid should be regarded as 'nasty stuff'. This is our answer.

Oil and gas companies in the USA have opposed public disclosure of the chemicals used in hydraulic fracturing. But according to American environmental investigators and a US House of Representatives Document (April 2011), well over 600 chemicals have so far been used in fracking fluid across more than a dozen states, including lubricants and biocides. The most widely used chemical is methanol (a hazardous air pollutant), along with isopropyl alcohol, 2-butoxyethanol and ethylene glycol, benzene, toluene, xylene and ethyl benzene. All of these are hazardous air and drinking water pollutants. Benzene is a known human carcinogen. Carcinogens in frack fluid also include naphthalene, formaldehyde, sulphuric acid, thiourea, benzyl chloride, acrylamide, acetaldehyde, ethylene oxide, lead compounds and propylene oxide. Many chemicals that have been used are proprietary and 'trade secret chemicals', making assessment of their health impact difficult. Two such were rejected by the EA from Cuadrilla's list of chemicals destined for use at the Balcombe site. The EA told us Cuadrilla could not explain what was in them. In the impending Balcombe 'test flow', Cuadrilla intend to use, amongst other chemicals, 9.99% solution of hydrochloric acid. Originally they wanted to use a 15% solution, until the EA told them anything over 10% will be considered toxic.

Around half the fracking fluid comes back up to the surface through the well. More fluid (or gas) can emerge elsewhere at unpredictable times and locations, posing serious health risks to farm animals, to humans, and to drinking water supplies, streams and rivers. Balcombe's well is particularly shallow at 823 metres, compared to the 'depths greater than 1500m' from which the British Geological Survey (BGS) claims 'mobilisation of solutes and methane is unlikely'.

Emeritus Professor of Geophysics at Glasgow University, David Smythe, questions the BGS, and is very concerned about rock faults acting as conduits to take such hazardous material back up to our immediate environment. He writes: 'A leaky fault is a fast-track back to shallow groundwater and to the surface for methane and other gases, as well as (perhaps) for the contamination of water resources by fracking chemicals. Juxtaposed against this, the question of earthquake triggering is but a sideshow. In France fracking has been banned partly because of this risk, which was pointed out in 2011 by geologists from the University of Montpellier.'

With the fracking fluid comes NORM – naturally occurring radioactive material - and other noxious substances from thousands of feet below the earth's surface. The Amec report predicts that the UK will have to find a way to dispose of up to 108 billion litres of toxic waste fluid for fracking operations. Currently there is no safe way of treating and disposing of this material, and it is deemed to be nasty enough that there is no waste facility in Britain equipped to treat it. This is a serious gap in the British Government's environmental planning.

In the USA, fracking waste fluid is often held in open lagoons (currently illegal in Britain). In America it has also been sprayed onto fields by drought-stricken farmers, or onto roads as anti-freeze. Much of it is 'reinjected' – that is to say disposed of down old mines and wells, where it can cause earthquakes by stressing and lubricating existing faults. It has also been discharged into the sea or into waterways, sometimes after minimal treatment. Recent reports have revealed 'elevated levels of radio-activity, salts and metals' downstream from US water treatment plants that have dealt with the flowback from fracking operations. According to Avner Vengosh, Professor of Geochemistry and Water Quality at the Nicholas School of the Environment, at Duke University, 'Years of disposal of oil and gas wastewater with high radioactivity has created potential environmental risks for thousands of years to come.'