

Submission

1. What are your views on the potential social, community and health impacts of an unconventional oil and gas industry in Scotland?

The Broad Alliance of Scottish Communities Against UOGE believes the social, community and health impacts of a UOGE industry would be disastrous. We have arrived at this view based on an extensive study of the available evidence, including peer-reviewed studies; other published smaller-scale studies and the recorded experiences of communities in countries where the industry already exists.

In particular we would refer you to:

A Public Health Review of High Volume Fracturing for Shale Gas Development, New York State Department of Health (2014).

Summarized below are some of the environmental impacts and health outcomes potentially associated with HVHF activities:

- *Air impacts that could affect respiratory health due to increased levels of particulate matter, diesel exhaust, or volatile organic chemicals.*
- *Climate change impacts due to methane and other volatile organic chemical releases to the atmosphere.*
- *Drinking water impacts from underground migration of methane and/or fracking chemicals associated with faulty well construction.*
- *Surface spills potentially resulting in soil and water contamination.*
- *Surface-water contamination resulting from inadequate wastewater treatment.*
- *Earthquakes induced during fracturing.*
- *Community impacts associated with boom-town economic effects such as increased vehicle traffic, road damage, noise, odor complaints, increased demand for housing and medical care, and stress.*

4,500 expert research hours were devoted to developing this report, including a literature review and direct contacts, questionnaires and interviews with academic and state bodies in areas where UOGE is happening. The report led Governor Cuomo to ban fracking in New York State and we believe the Scottish government should follow his example.

https://www.health.ny.gov/press/reports/docs/high_volume_hydraulic_fracturing.pdf

Health & Fracking, the impacts and opportunity costs, Medact, 2015

“The risks and serious nature of the hazards associated with fracking, coupled with the concerns and uncertainties about the regulatory system, indicate that shale gas development should be halted until a more detailed health and environmental impact assessment is undertaken.”

“Such an assessment has not been conducted yet, and would need to: account for all the potential risks to health, including their cumulative and compound effects on each other; be tailored to the specific geological, economic, environmental and social characteristics of the areas targeted for fracking; be based on projected levels of fracking at an industrial scale; and be conducted by a body that is entirely independent of the shale gas industry.”

https://www.medact.org/wp-content/uploads/2015/04/medact_fracking-report_WEB4.pdf

Unconventional Gas Exploration and Production: Human Health Impacts and Environmental

Legacy, National Toxins Network, 2016

This research based on the extensive Australian experience, maps the potential hazards of chemicals used in unconventional gas extraction. It reviews a list of additives and found these include chemicals that cause birth defects, endocrine disruptors and carcinogens. There is potential risk for these to enter the water table as a result of leaking pipes and spills.

In addition the report highlights the issue of air pollution:

There are many sources of toxic air pollutants in gas fields and related infrastructure, including high point vents, equipment/engines, drilling rigs, boilers/heaters, generators, flares, storage tanks, injection pumps, dehydrators, vehicles and gas skimmers. Major sources of air pollutants are the compressor stations that move natural gas through pipelines and gas processing plants.

<http://www.ntn.org.au/wp/wp-content/uploads/2016/05/NTN-Unconventional-Gas-Report-April-2016.pdf>

We would also suggest that the government ensure their decision is informed by the following:

Physicians For Social Responsibility Compendium of Evidence now in its 4th Edition (pages 92 – 101 Public Health effects measured directly) <http://www.psr.org/assets/pdfs/fracking-compendium-4.pdf>

Submission to the Scientific Inquiry into hydraulic fracturing in the Northern Territory, Dr. Geralyn McCarron March 2017 <https://frackinginquiry.nt.gov.au/?a=422812>

NTN Unconventional Gas Exploration and Production: Human Health Impacts and Environmental Legacy, Dr. Marian Lloyd-Smith April 2016

<http://www.ntn.org.au/wp/wp-content/uploads/2015/11/Nov-NTN-Unconventional-Gas-Report-NOV-2015f.pdf>

Unconventional natural gas development and birth outcomes in Pennsylvania, USA:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4738074/>

Scotland's Commissioner for Children & Young People , Fracking : A Children's Right Issue

<https://www.cypcs.org.uk/ufiles/Fracking-briefing.pdf>

2. What are your views on the community benefit schemes that could apply, were an unconventional oil and gas industry to be developed in Scotland?

Such payments would be negligible, if they materialised at all. They are potentially divisive in communities. The kinds of damage that will be done to communities living in new gas fields are beyond monetary compensation. These proposed payments should therefore not be a factor in the government's decision-making about whether to permit or ban UOGE.

3. What are your views on the potential impact of unconventional oil and gas industry on Scotland's economy and manufacturing sector?

The Broad Alliance believes the impact on Scotland's economy and manufacturing sector would be negative. The main research study we refer to in reaching this conclusion is the Scottish government's own economic impact study (KPMG 2017) and research/policy decisions from Victoria and New South Wales.

Permitting UOGE would require a shift in land use and infrastructure development policy to facilitate

an industry with a 42-year lifespan to the detriment of other established and new industries with a sustainable long-term future.

The development of extensive gas fields in Scotland's Central Belt would be potentially damaging to agriculture, tourism, the whisky industry and the Scotland brand overall.

The re-industrialisation (heavy industry) of the Central Belt is contrary to the plans and strategies for sustainable economic development adopted both by the Scottish government and all the local authorities in the licensed areas. (see BA submission to the KPMG study, which summarises the development plans of local authorities in the licenced area <http://www.broad-alliance.org/communitycase/>)

It is our view that the government's overall research has failed to quantify or even take note of, the extent of the industrialised infrastructure required by Unconventional Gas Extraction – exponential numbers of wells and well pads, compressor stations, gas pipelines running across and between well pads, storage tanks for chemicals and waste, sand heaps, drill waste heaps, new roads and significant heavy traffic. This is industrialisation on a major scale, which is not accounted for in any current land use plans. No studies have been published showing the extent of the land and infrastructure requirements of creating onshore gas fields.

In our view, the public is being seriously misled on the issue of the number of well pads and wells that would result if this industry were permitted. The number of Shale Gas wells quoted for the Central scenario (discussion pack handout p2, taken from the KPMG report). is 20 well pads with 15 wells per pad. This bears no relation to what INEOS, the main licenceholder in Scotland actually envisages. As this article confirms, INEOS upstream believes a typical exploration block (6 mile by 6 mile) would contain 10 drilling sites with 200 wells. If we extrapolate this across even the existing licensed areas we can see that what the industry actually has in mind is far greater than their public statements. <http://www.ineos.com/globalassets/ineos-group/businesses/ineos-upstream/why-shale-gas/shale-gas-offer/the-sunday-times-jim-ratcliffe-shale.pdf>

In return for this re-industrialisation of the Central Belt, paltry economic benefits would accrue. The Scottish Government's Economic Impact Study (KPMG 2017) states: "According to our estimates, the industry could represent an average of 0.1% of Scottish GDP (2015 figure) in our Central scenario and 0.3% in our High scenario **which is not a large contribution to the Scottish economy.**" (our emphasis).

Again according to the KPMG report, the number of jobs at the peak would be 1400 (central scenario); the Gross Value Added £70m a year (central scenario) Compare this to the actual economic impact of low carbon industries, which had an annual turnover of £10.7 billion and supported 43,500 jobs (2014, most recent available).

Minor benefits may accrue to manufacturers of pumps and other equipment, and to the petrochemical industry at Grangemouth in search of cheap feedstock for plastics manufacture. The Scottish government would need to show, through further study and analysis, how this would offset the problems UOGE would cause in other areas of the economy.

In banning UOGE, the government of the State of Victoria had reviewed the impact UOGE was having in Queensland and New South Wales and concluded that it was critically damaging to agricultural land, which is the core of Victoria's economy (see here for the governor's summary of their reasons <http://www.premier.vic.gov.au/banning-fracking-once-and-for-all/>). The state government of New South Wales is now trying to buy back licences, as opposition has grown and as the damage to other industry/agriculture/tourism has become clear (see for example <http://www.resourcesandenergy.nsw.gov.au/landholders-and-community/coal-seam-gas/information-on-petroleum-titles/buy-back>).

4. What are your views on the potential role of unconventional oil and gas in Scotland's energy mix?

As there is no intention that unconventional gas extracted in Scotland should form any significant part of Scotland's energy mix, this issue is not relevant to the case for banning or permitting UOGE.

The Scottish Government Economic Impact (KPMG, 2017) study confirms that the maximum contribution of unconventional gas to Scotland's energy mix would be 5.5 years worth of gas over 42 years. Furthermore, the main licence holder, INEOS, has confirmed that their intention is to use the gas extracted in Scotland to make ethane for the plastics industry and fuel gas for their own operations at Grangemouth.

However, even if it were the intention to use it in the energy mix, it is clear that a significant paradigm shift is taking place globally in energy generation. Solar energy has doubled seven times in 15 years, wind power 4 times. In 2015 renewables attracted double the investment of fossil fuels (Bloomberg Energy Research).

Energy Minister Paul Wheelhouse in launching this consultation, made clear the government's wish to have a joined up approach to the country's energy plans. Simultaneously with the consultation, he launched a draft Energy Strategy. It proposes to make energy efficiency a national infrastructure priority. It states that multiple benefits would accrue and these would contribute to meeting climate targets by decarbonising heat, but also wider economic, social, health and regeneration benefits, including:

- *measures to make our homes warmer and places of work more comfortable, promoting more affordable energy for consumers, helping to tackle fuel poverty and improving the competitiveness of the Scottish economy,*
- *the opportunity to create a substantial Scottish market and supply chain for energy efficiency services and technologies, with an estimated 4,000 jobs per annum, once fully operation, across Scotland, including in remote areas, based on initial estimated minimum investment in excess of £10 billion.*
- *measurable health and early years improvements through people living in warmer homes*
- *regeneration of communities through upgraded building stock, and*
- *substantially reduced greenhouse gas emissions contributing to meeting our ambitious climate change targets*

The Energy Strategy consultation asks:

How can Scotland best meet this vision and underpinning objectives in a way that is both socially and economically sustainable and supports long-term inclusive growth?

One answer to this question would be: do not waste government focus and public money on developing infrastructure and regulation for a new fossil fuel industry that will not contribute to decarbonising the energy supply (quite the opposite), or address fuel poverty or contribute to a sustainable, affordable energy supply.

<http://www.gov.scot/Publications/2017/01/2195/3>

5. What are your views on the potential environmental impacts of an unconventional oil and gas industry in Scotland?

It is the conclusion of the Broad Alliance that the environmental impacts of an unconventional oil and gas industry in Scotland would be entirely negative.

The Broad Alliance has read and assessed a wide range of published scientific and other expert opinion on this subject, including comment from sources such as the UK charity MEDACT, leading UK environmental organisations, and independent experts from around the world.

The Scottish Government has published no independent impact assessment of environmental issues related to UOGE. However, the report *“Independent Expert Scientific Panel – Report on Unconventional Oil And Gas”* commissioned by the Scottish Government and published in 2014, includes in chapter 6, section 9, a list of serious environmental risks related to fracking, such as: contamination of aquifers; water pollution from unplanned release of gas, drilling fluid or fracturing fluid; surface spills of chemicals or produced water; and contamination from construction or removal of infrastructure.

The Broad Alliance considers that the main threats to the environment from the development of an unconventional oil and gas industry would be:

- pressures of industrialisation on Scotland's land and water resources
- pollution of soils, air and natural water systems by chemicals used in gas extraction
- contribution to climate change-driven environmental damage

Agricultural lands, natural habitats and land available for public amenity are all under pressure in Central Scotland from urban development. The development of an unconventional oil and gas industry in Scotland would further pressurise these resources and the benefits they offer, requiring as it does multiple well-sites with associated landscaping, access roads, industrial infrastructure and intensive industrial activity.

UOGE produces profound and irreversible changes to the underlying geological structure. Underlying geology is part of the natural environment and is to a large extent responsible for shaping landscape and sustaining soils, forests, agricultural lands and water systems. In areas where it has taken place, fracking has been responsible for the lowering of water tables by disrupting aquifer systems, with resulting negative impacts on landscapes as a whole.

We do not understand why hydrogeology has not been studied as part of the evidence gathering, given the density of faults and abandoned mine workings in the Midland Valley and their proximity to densely populated areas. An analysis of the risks should have been made available to the public during the consultation process. Groundwater is an important resource in Scotland, and is vital to agriculture and the mineral water and whisky industries.

At the Falkirk Public Inquiry many concerns were raised regarding the potential for fluids and gases to migrate via pathways such as faults and old mine workings. Falkirk Council objected to Dart Energy's planning application as a result of concerns over hydrogeology, which remained unresolved after many months of technical exchanges between AMEC consultant Dr S Salmon (employed by Falkirk Council as an independent consultant) and Dart Energy.

Quoting from Falkirk Council's closing submission to the Public Inquiry (Section 6):

“As a result, it remains conceivable that groundwater support for watercourses and conservations sites in the area could be significantly affected, by way of drawdown effects transmitted along faults and associated damage zones” (Section 6.3)

“It also remains conceivable that fugitive gas emissions could arise during the development and significantly affect water quality in the Passage Formation regional aquifer, the overlying local aquifers and surface watercourses, and also significantly affect properties and residents in the area, by way of gas flow and dispersion through faults and/or overlying strata”. (Section 6.4)

“Dr Salmon's evidence presented the only coherent and detailed description of the flow processes in the vicinity of the vertical production wells and their associated laterals. He demonstrated there remain two overarching concerns of possible dewatering and fugitive emissions, and noted that fugitive emissions could also arise as a result of the dewatering of old mine workings in the vicinity of the proposed development...” (Section 6.6)

The full closing submission from Falkirk Council can be found here:

The Health Protection Scotland Health Impact Assessment recognises that faults can be potential pathways for migration of pollution (HIA p59-60 and Figure 7). It states that “Bergmann et al., (2014) identified four different water-related impact pathways (Figure 7). These include: discharge of pollutants directly at ground surface during handling of HF fluids or flowback; pollutant discharges and migration along production wells or wells from legacy activities of other types of exploration; movements of pollutants along geological faults; and lastly, movements that depend on geological and hydrogeological conditions (which may result in the rise and the lateral spreading through geological strata e.g. via an aquifer). Disposal of flowback fluids, whether via underground disposal wells (by injection) or otherwise, is an additional water-related exposure pathway (Bergmann et al., 2014).

Disturbance to wildlife and communities caused by noise, light and traffic during continuous 24 hour drilling and extraction activity would contribute to environmental degradation of both urban and rural areas.

The Broad Alliance agrees with the UK's leading environmental bodies that unacceptable risks of environmental damage are posed by chemical additives used to facilitate gas extraction by fracking.

The partnership report *‘Hydraulic fracturing for shale gas in the UK: Examining the evidence for potential environmental impacts’* was produced by environmental groups The Royal Society for the Protection of Birds, The National Trust, The Angling Trust, Salmon and Trout Association, The Wildlife Trusts and The Wildfowl and Wetlands Trust. It details some of the chemicals used in fracking water:

The number and types of chemicals are determined by each site's unique characteristics, but additives may include hydrochloric acid, polyacrylamide, isopropanol, potassium chloride and ethylene glycol and low concentrations of pH buffers, corrosion inhibitors, biocides and gelling agents.”

Of the polluting potential of fracking water, the same report says:

Accidental spills and leaks can occur during the mixing, storage or transport of the flowback and produced waters, often leading to groundwater contamination from the surface. Once contamination of groundwater has occurred, clean-up is incredibly difficult and may take many years.

www.rspb.org.uk/Images/shale_gas_summary_tcm9-365778.pdf

While climate change effects exacerbated by continued extraction and consumption of fossil fuels are likely to produce most damage to the environment, issues of climate change policy and targeted reduction are addressed separately in Question 6. However, the Broad Alliance agrees with the consensus of scientific and other expert opinion that environmental changes resulting from climate change will have severe negative impacts. These include: loss of agricultural land and productivity across the world, through combinations of flood, drought and severe weather; loss of ocean environments which sustain marine life to mankind's benefit and the subsequent impact on both organised and subsistence fishing for food; and loss of natural habitats such as bogs, forests and grasslands which sustain bio-diversity and benefit mankind through the provision of ecosystem services.

Ecosystem services such as the natural carbon-storage provided by peat bogs and wetlands is now recognised as vital in tackling climate change. Damage to these resources during unconventional gas extraction through intentional or accidental drainage, landscape disruption such as bunding to contain spillage at well-sites or through direct contamination by spillage of chemicals or contaminated flowback water would incur loss of habitat, wildlife and ecosystem services. Remediation, where possible, would be difficult and costly. The Broad Alliance considers that the risk of total and

irrecoverable loss of such resources, even on a small scale, is unacceptable.

The Broad Alliance believes that environmental damage is inevitable and unavoidable in all of the unconventional gas production scenarios proposed by the authors of the Scottish Government's independent impact assessment statements. This includes environmental damage caused as side-effects of the following activities:

- unconventional gas extraction processes (e.g. effects of associated oil-fuelled transport systems, landscaping machinery for creation of well-pads, drilling machinery, on site generators, and compressors to create both fracking pressures and compression of extracted gas for transport where pipeline infrastructure does not exist)
- the process of refining of raw materials from unconventional gas extraction (whether for reduction to methane for fuel, ethane for plastics production, or extraction of chemicals for processing into agricultural fertilisers or other chemical feedstock)
- the continued burning of fossil-fuel derived from unconventionally extracted gas (whether as fuel used 'in-house' by the gas and oil refining industry, as fuel to generate electrical energy for domestic consumption or as methane gas for domestic consumption)
- disposal by landfilling, or recycling as low-grade, low environmental-benefit products, of short-lived plastics-based consumer goods and packaging derived from gas and oil.

The Broad Alliance does not agree with suggestions that a 'trade-off' of environmental damage (even with compulsory remediation of damage as a regulatory feature of the industry), exchanged in order to generate any level of employment or economic benefit, is either necessary or acceptable.

Examination of historical industrial mining processes throughout Scotland shows that environmental damage from mining-related industry is widespread and persistent. Remediation of such damage is often of a basic type e.g. tree-planting to disguise landscape scarring and to partially restore damaged or lost habitat, and is frequently funded from the public purse. Weaknesses in the current PEDL licensing system mean that remediation of well failures after decommissioning, with resultant environmental damage such as escape of contaminated produced water or other mine water into ground-water, rivers or wetlands, would be likely to fall to public bodies where licenses have lapsed or the entity which owned the license has ceased to exist. The Broad Alliance considers that future monitoring and restoration of agricultural, natural and urban environments affected by unconventional oil and gas extraction would be an unacceptable burden on public financial resources.

We are particularly concerned about the impact of the massive increase in traffic the industry would generate:

The total number of truck movements in the US during the fracking phase alone can be anywhere from 600 to 1,000 one-way trips per well. (5) This suggests upwards of 6,000 truck movements during this phase for a ten well pad. During the heaviest period the total number of trips could be as high as 250 per day. New York State Department of Environmental Conservation also estimated that 100 truck movements per well are estimated to be needed for wastewater disposal. That would be a total of 1,000 movements for a ten well pad. This figure would be less if pipelines were available for the delivery and disposal of water.

However, Broderick et al suggest that the data for New York combined with data in relation to exploratory drilling in the UK "...suggests a total number of truck visits of 7,000-11,000 for the construction of a single 10 well pad in the UK."

Damage to the natural and man-made living environment of Scotland, during both the production phase and in a future with a large number of decommissioned and aging gas wells, would result in

corresponding damage to the economic 'brand' of the country, which is to a large extent based on scenic tourism and food production. The latter includes, as well as the production of grain and vegetables crops, internationally renowned products such as farmed meats, wild and farmed fish and game, whisky and related spirits and more recently, an expanding 'craft beer' industry. These industries rely on clean water, good air quality and uncontaminated soils, both literally to enable production and also symbolically to support marketing at home and abroad. Tourism and leisure activities similarly depend on unspoiled landscapes or at least landscapes with minimal industrial intrusion and impact. It is therefore the conclusion of the Broad Alliance that the development of an unconventional oil and gas industry in Scotland would, through negative impacts on the environment, have a negative impact on the economy.

6. What are your views on the potential climate change impacts of unconventional oil and gas industry in Scotland.

The Broad Alliance believes that Unconventional Gas Extraction would make it impossible for Scotland to meet its climate targets. We have reached this conclusion based on an extensive review of published research on the climate impacts of UOGE in the United States and in particular the methane emissions which have shown that in climate terms, UOGE is more polluting than coal. In this submission, however, we have focused almost entirely on the Scottish government's own impact study carried out by the Climate Change Committee. In our view it puts a powerful case for not permitting UOGE in Scotland.

It states:

“the implications for greenhouse emissions of UOG exploitation are subject to considerable uncertainties” and “this uncertainty alone calls for close monitoring of developments.”

“if exploitation of UOG is to be pursued, it requires that a strong regulatory framework is put in place.” and “it may ultimately necessitate the establishment of a dedicated regulatory body.”

And finally, what is in our view the key section of the CCC report which states

“our assessment is that exploiting UOG by fracking on a significant scale is not compatible with Scottish climate targets unless three tests are met”.

Test 1 “emissions must be tightly regulated and closely monitored.”

“Much greater clarity is necessary over the respective roles of different actors in this system entailing full coverage of greenhouse gas emissions...from all sources.”

“a monitoring regime that catches potentially significant Methane releases early is essential.”

“The regulatory regime must require proper decommissioning of wells at the end of their lives. It must also ensure that the liability for emissions at this stage rests with the producer.”

“The present regulatory regime in Scotland is unclear in relation to the respective roles of the different organisations in the permitted and planning process.”

“Before any production can occur,...”The regulatory regime requires much greater clarity over the roles of the different actor...and that these be managed seamlessly.”

“The regulatory framework should also ensure that regulation covers all emissions, of both CO2 and Methane, requires strict limiting of these emissions, entails long-term monitoring and has full geographical coverage of emissions related to UOG supply prior to the gas being injected into the gas grid or put to use.”

“As evidence improves, it is likely to be cost-effective and necessary to require the inclusion of further emissions reduction measures.”

“This underlines the importance of a regulatory approach that requires such an implementation of techniques and technologies, with clear consequences should these requirements be violated.”

“the Scottish Government has pledged to look at further tightening of regulation.”...“It is essential that this tightening does occur before any UOG production commences in Scotland.”

It is clear that no regime exists in Scotland capable of delivering such an intense level of regulation and monitoring. How are the significant costs associated with the establishment of this fully independent regulatory body to be met? Where are the personnel with the skills to fill such positions to be found? How are the costs of the actual monitoring of, for instance, environmental and safety issues of the industry to be met? And finally on this issue, we would refer you to the UNEP Global alert quoted in our answer to Question 7, which confirms that this is an industry which in effect cannot be made safe whatever the level of regulation and monitoring.

Test 2 Consumption

“This means that Scottish UOG production must displace imported gas rather than increasing domestic consumption.”

“gas consumption must remain in line with the requirements of Scottish emissions targets.”

“There is no case, however, for higher levels of gas consumption than we have previously set out.”

“The long-term path for Scottish gas consumption, assuming emissions targets are met, depends strongly on whether or not CCS (carbon capture and storage) is deployed.” “the absence of CCS would also make it more difficult to accommodate the emissions associated with production,”

“Unabated gas consumption must be consistent with the levels in the scenarios presented in our advice on Scottish annual targets,”... Allowing unabated consumption above these levels would not be consistent with the decarbonisation required under the Climate Change (Scotland) Act.”

Given the strict Scottish emissions targets (which are planned to become even stricter in the future), emissions from UOGE would put severe pressure on the Scottish Government’s ability to comply with the ‘decarbonisation required under the Climate Change (Scotland) Act’.

Test 3 Targets

“Additional production emissions from shale wells will need to be offset through reductions elsewhere in the Scottish economy,”

“Domestic production of UOG will lead to some additional Scottish emissions, even if fossil fuel consumption is not affected and emissions relating to production strictly limited through tight regulation and monitoring. The size of these extra emissions depends on the size of the future industry, about which there is considerable uncertainty.”

“In a high production scenario, in which the industry grows rapidly, the impact on domestic emissions from Scottish production could be around 1.6MtCO₂e/year in 2035..... This is slightly greater in magnitude to the emissions savings in the agriculture sector under our advice on Scottish annual targets. If regulation were more lax, emissions would be significantly higher.”

“The high level of ambition embodied in Scottish annual emissions targets means that finding offsetting effort elsewhere in order to accommodate even more moderate additional emissions from UOG production or other sources (e.g. aviation) would be challenging.”

It is evident from the scenario presented in Test 3 that it would be extremely challenging for UOG production to take place, especially given the “considerable uncertainties.” Emissions savings would have to be found elsewhere in the economy, and reductions in gas imports, to offset the additional emissions from UOGE. This would not be a rational step for the government to take.

Reserves...Exploration phases in Scotland...“In the US thousands of exploration wells were drilled before the industry took off.”...“It has been estimated such a process would take over 2 years to ascertain the commercial viability of the industry, although some reports estimate that it could take as long as 10 years based on the US experience.”

Exploratory drilling on this scale, mostly in Scotland’s densely populated Central Belt, is mind boggling, especially when all it may prove is that the industry is not commercially viable.

Impact on fossil fuel prices.

“Scottish UOG production will do little to reduce energy bills”.... “ This finding is consistent with those of other studies, including that of KPMG.”

This statement, once and for all, destroys the myth that the domestic end user of UOG production would see reduced tariffs.

Emissions.

“Changes in gas consumption could also affect the level of fugitive emissions from the transmission and distribution grid. These emissions are important and should not be ignored.”

“It should not be taken as a given that emissions from exploration will be low, especially for any extended well tests.”

“Land-use change emissions could be significant if development occurs on carbon rich land”...“Given the scale of such potential emissions, production on such land should not be allowed.”...“Land-use change emissions may also be significant for other types of land.”

Liquids unloading

“The range of measured and estimated emissions from liquids unloading is extremely large, with little understanding for this variation and of how and why these emissions vary across wells in different regions and of various ages.”

Pneumatic devices and Compressors also emit not inconsiderable amounts of gas during the production stage.

“One of the major contributors to overall production emissions is found to be from what are referred to as super-emitters: significant leaks of methane left unchecked for significant periods of time.”...“Further work is required to understand the characteristics that cause individual sites to be a super-emitter.”

“it may turn out that some shale wells produce small volumes of gas and it is therefore uneconomic to inject the gas into the grid or supply a customer directly.”....“this gas should be flared,”

“It is not possible to state with certainty the emission impact of a given level of Scottish production.”

Emissions targets “Over time, it is therefore likely to become increasingly challenging to accommodate emissions relating to domestic UOG production.”

The various sources of emissions all add up and they are just the ones that are detected. Super-emitters present communities with a nightmare scenario, which, the report confirms, is not fully understood. This is totally unacceptable to communities. It beggars belief that flaring off small uneconomic volumes of gas, close to people’s homes, farms and businesses, could be proposed. The Scottish government must recognise that this would be an inevitable result of their giving permission for the development of UOGE.

Direct supply to industry. “If this leads to increased hydrocarbon consumption as a feedstock (e.g. in the petrochemicals industry), there could be an impact on emissions. This was not examined quantitatively in the parallel study on economic impacts and scenario development. We have therefore been unable to assess this quantitatively.”

Any further increase in emissions once again put the Scottish Government under severe pressure to comply with its strict climate targets.

CCS: “the absence of CCS is likely to require near-full decarbonisation of surface transport

and heat in buildings by 2050. It is difficult to see how significant further emissions reductions could be found to offset the impact of additional fossil fuel production.”

This statement on its own surely destroys any chance of UOGE being given the go ahead by the Scottish Government.

“The prospects for a Scottish UOG industry are currently highly uncertain.”..... “This can only be resolved via exploratory drilling. But even if such exploration produces favourable results, other uncertainties remain,”...“the production emissions that do occur are offset by actions to reduce emissions elsewhere in the economy.”

Modelling: “This provides an indication that the economics of UOG in general are not favourable.”...“It is uncertain whether the conditions which led to the dramatic increase in US shale production will be replicated in Scotland or elsewhere”....”In reality, the level of potential production will remain highly uncertain until a sufficient level of exploratory drilling has been undertaken across the Midland Valley basin.”

In the view of the Broad Alliance this report confirms that it impossible for the Scottish government to maintain its climate change commitments, and permit UOGE. The report is damning for the climate impacts of UOGE. The level of uncertainty is staggering, and the Scottish Government must surely come to the conclusion that UOGE is not feasible given the findings of this report alone.

Finally, we note that the UOGE industry and the UK government broadly rely on Mackay & Stone, for DECC, 2012 as a foundation for their view that Unconventional Gas can be a greener alternative to fossil fuels. This report is based on flawed research. We refer you to this review of Mackay & Stone commissioned by Talk Fracking:

http://www.talkfracking.org/wp-content/uploads/2013/04/20170200-whitehalls_fracking_science_failure-lq.pdf

7. What are your views on the regulatory framework that would apply to an unconventional oil and gas industry in Scotland?

The Broad Alliance has reached the view that this industry cannot be “regulated” into safety. We would refer you to this United Nations Environmental Protection Global Environmental Alert:

UG exploitation and production may have unavoidable environmental impacts. Some risks result if the technology is not used adequately, but others will occur despite proper use of technology. UG production has the potential to generate considerable GHG emissions, can strain water resources, result in water contamination, may have negative impacts on public health (through air and soil contaminants; noise pollution), on biodiversity (through land clearance), food supply (through competition for land and water resources), as well as on soil (pollution, crusting).’

https://na.unep.net/geas/archive/pdfs/GEAS_Nov2012_Fracking.pdf

And to the report from Professor Andrew Watterson of the University of Stirling
<http://www.regulatingScotland.org/report/frackingandregulation.pdf>

And as we have stated previously in Question 6, to regulate this industry to ensure that emissions targets are not breached time after time, a new regulatory authority would probably be needed. Who will pay for this? And given that SEPA has undergone cuts of £30m in its budget, how is it to rise to the challenge of regulating an entirely new and risky fossil fuel business?

8. Overall, and in light of the available evidence, what do you think would be the main benefits, if any, of an unconventional oil and gas industry in Scotland?

No benefits. In light of the available evidence there is no rational basis for permitting UOGE in Scotland.

9. Overall, and in light of the available evidence, what do you think would be the main risks or challenges, if any, of an unconventional oil and gas industry in Scotland?

- Danger to health especially the health of children and the unborn.
- Risk to mental health and well being of people living in gas fields.
- Creation of “sacrifice zones” where people will be unable to sell their homes and new development is halted both for housing and clean business.
- 24-hour noise pollution and heavy traffic carrying dangerous cargoes on rural roads.
- Scotland unable to meet its climate targets
- Damage to tourism, food and drink industries
- Cost to taxpayer of intensive monitoring and regulation
- Negative impact on development of clean, sustainable jobs
- Public purse left to clean up when the industry’s short life ends.
- Once land and water is contaminated with fracking chemicals and chemicals and radioactivity brought up from underground, there is no way to clean it.
- Division in communities
- A breakdown of trust between communities and the state if UOGE is forced on people in the absence of any social licence.

10. If you have any other comments on the issues discussed in this consultation, please provide them here.

1. The First Minister promised in the Scottish Parliament that unless it could be proved that fracking could be done without risk to health and the environment, it would not be permitted. The Scottish Government’s own impact studies highlight significant health, environmental and climate risks, not to mention the significant new evidence that has emerged since the studies were commissioned. On that basis, the government should keep its promise and ban UOGE.

2. The KPMG Economic Impact study says there is no significant benefit to Scotland’s economy – why is unconventional gas even being considered?

3. How will the Scottish Government make other industries and agriculture cut their emissions to make up for the emissions from fracking, as proposed by the Climate Change Committee?

4. The public will end up paying for the clean up and abandoned wells if the market fails – this is already happening in the United States. There is speculation that future licences might include bonds to be held in trust to pay for any clean-up should the company go bankrupt or fail to fulfil its obligations – a kind of insurance policy. But it is not clear that the licences already granted by the UK government can be amended to include bonds.

5. This is a Scotland-wide consultation but the views of communities that will be most affected must have more weight in the decision-making process.

In conclusion, The Broad Alliance of Scottish Communities Against UOGE is the community-based opposition to Unconventional Oil and Gas and it includes active campaign groups and community councils in all the areas currently licenced, with a total population in areas covered of around 1.5 million people. Based on our active campaigning and extensive engagement over several years, we have found absolutely no support anywhere, in any community, for UOGE and in fact we have found universal opposition.

We would argue that this level of opposition represents a total refusal of any social licence for UOGE

in Scotland. If this proves not to be the deciding factor in the decision on whether to ban UOGE, then the Scottish government will have to honestly admit where in Scottish society it has identified support for this industry, and whose interests will be served by permitting it.