

Shale Gas and Fracking

A Briefing Paper from the Mission and Public Affairs Council and the Environment Working Group of the Church of England

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The Mission & Public Affairs Council of the Church of England is the body responsible for overseeing research and comment on social and political issues on behalf of the Church. The Council comprises a representative group of bishops, clergy and lay people with interest and expertise in the relevant areas, and reports to the General Synod through the Archbishops' Council.

The Environment Working Group was set up in 2014 in response to a motion passed at General Synod, to be a voice in the public square arguing for environmental responsibility; to challenge the Church of England at all levels to strive to safeguard the integrity of creation and sustain and renew the life of the earth, and to develop policies and actions for the Church .

INTRODUCTION

Shale gas extraction is a relatively novel technology in the UK, with only a handful of wells drilled at November 2016. It is controversial both in affected communities and beyond, with public support at only 17%¹. The controversial nature of fracking concerns both the technique itself, its risks and safeguards, and its place in a national strategic energy policy. It is important that questions around the practical safety of the fracking technique are not conflated with strategic energy policy questions.

As more applications for test drilling and fracking are granted, some affected communities are looking to the Church of England for leadership and perspective on the many issues concerned.

This paper seeks to give a factual scan of the main issues around communities, planning, and the environment, in the context of UK energy policy and the UK's commitment to carbon reduction targets under the COP21 agreement. The briefing will:

- Identify possible impacts of shale gas exploration and fracking for the Church of England, including dioceses, parishes and the Church Commissioners.
- Suggest a role for dioceses and parishes in working for greater understanding and trust
- Inform MPA's public affairs work on evidence-based ethics, assisting a planned response to shale gas developments
- Contribute to the Ethical Investment Advisory Group's work on Extractive Industries

¹ DBEIS, 2016, "Energy and Climate Change Public Attitude Tracker Wave 19"

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/563236/Summary_of_key_findings_BEIS_Public_Attitudes_Tracker_-_wave_19.pdf

This paper has been prepared in November 2016 for the Church of England Environmental Working Group and the Mission and Public Affairs Council, with assistance from the Church Commissioners and Ethical Investment Advisory Group.

This briefing uses a range of recent information already in the public realm. Perhaps the most important source is the Committee on Climate Change's July 2016 report on fracking, which called a wide range of highly qualified independent experts to give evidence on greenhouse gas emissions from fracking and the impact on carbon budgets². We regard this report as a good example of a balanced and well-informed analysis of the risks, mitigations and strategic issues involved in fracking. We do not intend here to duplicate the work of this report unnecessarily.

Fracking in UK – 2016

A total of 4 wells have gone into the shale layer in the last five years and only one – Preese Hall, Lancashire, in 2011 – has been fracked. A moratorium put in place after small earthquakes near that site was lifted in 2012. The Government has expressed its support for fracking in the UK and in Sept 2016 the Secretary of State approved planning appeals for two exploratory sites in Lancashire. Appendix 1 summarises current developments of fracking sites.

The Scotland Act 2016 devolved shale gas licensing to the Scottish Parliament, which in January 2015 voted for a moratorium on hydraulic fracturing, pending a period of public consultation that will be informed by a further review that has been commissioned into potential impacts.

In Wales, the UK Government has plans to devolve fracking licences to the Welsh Government, and has decided not to make fracking decisions in the country in the meantime. The Welsh Government is opposed to fracking and in February 2015, ahead of the licensing powers being granted, told councils they must refer such planning applications to Welsh Government ministers.

Shale gas resources and potential in the UK

Most observers agree that shale gas will not be as important in the UK as it is in the US. As of 2016, drilling for shale gas in the UK remains at an exploratory phase³, the UK has less land to drill on, and landowners do not own the rights to hydrocarbons beneath their land.

Shale beds are not found all over the UK. The geological formations with the most shale gas potential are across a swathe of the North of England, from Liverpool and Blackburn to North Yorkshire; Wales near Swansea; the Weald Basin in Sussex, and the Midland Valley of Scotland⁴. Shale gas in the northern England shale formation is estimated at 37 trillion cubic meters of gas⁵. However, the amount that is potentially recoverable could be only 8-20% of that, and these figures are subject to significant uncertainties, so it is difficult to estimate how much shale gas could be extracted successfully and safely. More accurate estimates of the commercial potential can only be obtained by test drilling.

Various claims have been made as to the impact on the economy of a shale gas industry – the number of wells that could be drilled, the number of jobs that might be supported in regions with

² Committee on Climate Change, 2016, "Onshore Petroleum: the compatibility of UK onshore petroleum with meeting the UK's carbon budgets" <https://www.theccc.org.uk/publication/onshore-petroleum-the-compatibility-of-uk-onshore-petroleum-with-meeting-carbon-budgets/>

³ House of Commons Library, 2016, Briefing Paper number 6073 "Shale Gas and Fracking"

⁴ DECC/ British Geological Survey, 2012, "Unconventional Hydrocarbon Resources of Britain's Onshore Basins – Shale Gas"

⁵ Andrews, I J, British Geological Survey for DECC, 2013, "The Carboniferous Bowland Shale gas study: geology and resource estimation"

high unemployment, and the effect on energy prices⁶. However, there are many uncertainties around all these predictions.

On current levels of activity, and with the uncertainties introduced by leaving the European Union, volatile oil prices and rapid changes in energy generation technologies, the place of fracking within a comprehensive energy policy is far from conclusive and any large scale extraction of shale gas in the UK – if it happens at all – is likely to be some years away.

Regulation and legislation

The UK has one of the most stringent onshore drilling safety regimes in the world. The Department for Energy and Climate Change (now DECC) has published regulatory roadmaps for onshore oil and gas exploration in each nation of the UK, which set out the process to be followed within each legislative and regulatory framework⁷.

All rights to petroleum resources are vested in the Crown, and Government issues Petroleum Exploration and Development Licences (PEDLs) which allow companies to explore and develop unconventional gas. Other aspects of regulation include:

- Planning permission
- Environmental permits, including for mining waste
- Health and safety regulation
- Consent from Department for Business, Energy and Industrial Strategy to drill and frack.

The regulatory authorities named in the government's guidance include the Environment Agency, Health and Safety Executive, the relevant Minerals Planning Authority, and DECC as owner on behalf of the Crown. These agencies have a statutory duty to ensure that any exploration and development, including fracking operations, is done in a way that protects people and the environment. There are also important roles for the Oil and Gas Authority and Public Health England. The National Planning Policy Framework guidance directive to the planning authorities makes an assumption that the regimes will operate effectively.

THEOLOGICAL AND ETHICAL ISSUES

1. Shale gas within a transitional low-carbon energy policy

The Lambeth Declaration 2015, signed by the Archbishops of Canterbury and York and other faith leaders in the UK, recognised the urgent need for action on climate change and the need to transition to a low-carbon economy⁸.

In May 2015, the National Investing Bodies of the Church of England⁹, advised by the Ethical Investment Advisory Group (EIAG), adopted a new climate change policy. The policy sets out a comprehensive, distinctly Christian approach to climate change and responsible investment, demonstrating commitment to a transition to a low carbon economy through divestment from companies specialized in the extraction of the highest carbon fossil fuels (thermal coal and oil

⁶ Institute of Directors, 2013, "Infrastructure for Business: Getting shale gas working"

⁷ Oil and Gas Authority, "Regulatory roadmap: onshore oil and gas exploration in the UK regulation and best practice"

⁸ Lambeth Declaration 2015, <https://www.churchofengland.org/media-centre/news/2015/06/archbishop-of-canterbury-join-faith-leaders-in-call-for-urgent-action-to-tackle-climate-change.aspx>

⁹ The National Investing Bodies of the Church of England are the Church Commissioners, Church of England Pensions Board and CBF Church of England Funds

sands), seeking out low-carbon investments and engagement with companies and public policy¹⁰. The policy is grounded in Biblical and theological reflections. A key theme is that:

“Humankind has a divinely mandated responsibility for the physical world, for its creatures and for one another, especially the weakest and least. This mandate also requires us to do all we can to minimise damage to creation and God’s creatures, and to promote all that is good and that brings the kingdom of heaven into ever greater realization on earth.”

The policy notes that shale gas may help reduce greenhouse gas emissions as part of the transition to a low-carbon economy, but that this does not negate the importance of other issues such as environmental impacts and the effect on local communities⁶.

Some Christian NGOs take a campaigning stance, opposing fracking because of the impact of fossil fuels in exacerbating global climate change¹¹, and noting research by the International Energy Agency that, in the absence of a strong climate policy, continued global expansion of gas supply from unconventional resources, alongside exploitation of other fossil fuels, could lead to global temperature rises of 3.5°C, well above the 2°C rise that is necessary to keep below to avoid dangerous climate change¹².

However, this is where it becomes important to distinguish the arguments about fracking as a technique from arguments about how to transition to a low(er) carbon economy. If developing the techniques of fracking provides an alibi for relaxing efforts to reduce carbon consumption, it is obviously unhelpful. But the government’s commitment to COP21 means that overall carbon consumption in the UK must be constrained whatever its source. And, as shale gas is a cleaner option than some alternatives, the case can be made that, as transition to a low carbon economy is a gradual process, shale gas has an important place in such a policy. It is indeed true that if the exploitation of global shale gas resources were additional to existing expected carbon consumption, there would be potentially catastrophic global temperature implications. But the substitution in the UK of domestically produced shale gas for other carbon sources (both coal and imported natural gas) would be a different matter.

The EIAG is in the process of developing a new policy for the three National Investing Bodies on the extractives industries, including oil, gas and mining. This work goes deeper into the theological considerations around extractive industries and will distinguish ethical and theological issues that are intrinsic to the ways that extraction is undertaken from wider issues which frequently occur in the extractive sector but which are not unique to it. Separately, the National Investing Bodies as part of the implementation of their climate change policy are soon to launch the Transitional Pathways Initiative (TPI) which will guide ethical engagement on climate change with companies in which the Church invests.

2. Fracking and UK energy strategy

The Government has stated clearly that it believes shale gas has the potential to provide the UK with greater energy security, growth and jobs.¹³ It therefore supports fracking in various ways including

¹⁰ Ethical Investment Advisory Group (EIAG) of the Church of England, 2015, “Climate Change: the policy of the National Investing Bodies of the Church of England and the Advisory Paper of the Ethical Investment Advisory Group of the Church of England”

¹¹ Christian Aid, 2016, “Does Christian Aid Support Fracking?” <http://www.christianaid.org.uk/ActNow/climate-justice/resources.aspx?Page=4>

¹² International Energy Agency, 2012, “IEA World Energy Outlook special report on unconventional gas”

¹³ DBEIS, accessed November 2016, “Guidance on fracking: developing shale oil and gas in the UK” <https://www.gov.uk/government/publications/about-shale-gas-and-hydraulic-fracturing-fracking/developing-shale-oil-and-gas-in-the-uk>

cutting tax rates, speeding up planning applications, and seeking to counterbalance the impact on local communities through proposing a Shale Wealth Fund¹⁴.

A coherent low-carbon energy strategy: A key question is how shale gas contributes to a long-term UK energy strategy, consistent with the transition to a low carbon economy and the UK's commitments to the Paris COP21 agreement. To meet these targets, the Government sets Carbon Budgets which restrict the total amount of greenhouse gases the UK can emit over a 5 year period. If emissions rise in one sector of the economy, the UK must achieve corresponding falls in another sector.¹⁵ Emissions Reduction Plans set out various scenarios, towards the overall target of 80% reduction in greenhouse gases by 2050. The next Emissions Reduction Plan is expected in early 2017.

Heating is a particular challenge for the low-carbon strategy, as most UK homes are heated by gas. Transition to alternative low-carbon forms of heating would require large infrastructure changes to production and distribution, as well as changes in individual homes (similar to the transitions during the 1950's to 70's from coal, to 'town' gas, to natural gas). Options for cutting carbon emissions from heating would include increasing the amount of bio-gas or hydrogen in the mix of gas that comes into our homes; electrification of heating; and increased use of biomass and heat pumps. All of these alternative technologies are currently operating at very small scale in the UK. The Committee on Climate Change has called on the Government to produce a credible new strategy and a much stronger policy framework for buildings decarbonisation over the next three decades¹⁶. We support this call and believe that it is a crucial aspect of a robust transitional energy policy.

Greenhouse gas emissions: In 2013, the government's Chief Scientific Adviser recommended to DECC (now DBEIS) that more work was needed to monitor emissions, particularly methane, a potent greenhouse gas, and to explore the life-cycle carbon footprint associated with extraction and use¹⁷. Again, we support the call for more work of this kind.

Committee on Climate Change report: The Committee on Climate Change (CCC) released a report into the future of shale gas in the UK in 2016¹⁸ which found that the exploitation of shale gas on a significant scale is not compatible with UK carbon budgets, *unless three tests relating to emissions, gas consumption and carbon reductions are satisfied*:

- Emissions must be strictly limited during shale gas development, production and well decommissioning. This requires tight regulation, close monitoring of emissions, and rapid action to address methane leaks
- Overall gas consumption must remain in line with UK carbon budgets. The production of UK shale gas must displace imports, rather than increase gas consumption.
- Emissions from shale gas production must be accommodated within UK carbon budgets, Emissions from shale exploitation will need to be offset by emissions reductions in other areas of the economy to ensure UK carbon budgets are met.

¹⁴ HM Treasury, 2016, Shale Wealth Fund Consultation <https://www.gov.uk/government/consultations/shale-wealth-fund>

¹⁵ DBEIS, 2016, "Carbon Budgets" <https://www.gov.uk/guidance/carbon-budgets#policies-and-proposals-to-meet-carbon-budgets>

¹⁶ Committee on Climate Change, 2016, "Next Steps on Heat Policy" <https://www.theccc.org.uk/wp-content/uploads/2016/10/Next-steps-for-UK-heat-policy-Committee-on-Climate-Change-October-2016.pdf>

¹⁷ DECC, 2013, Potential greenhouse gas emissions associated with shale gas production and use: a study by Prof. David Mackay and Dr Timothy Stone

¹⁸ Committee on Climate Change, 2016, "Onshore Petroleum: the compatibility of UK onshore petroleum with meeting the UK's carbon budgets" <https://www.theccc.org.uk/publication/onshore-petroleum-the-compatibility-of-uk-onshore-petroleum-with-meeting-carbon-budgets/>

The Government's response to the CCC report was confident that these tests could be met¹⁹. It believes that gas – including shale gas – can be a bridge to low-carbon energy, while the UK phases out old coal generation and develops energy efficiency, renewables and nuclear. However, the impact on emissions depends on how shale gas is produced and used. If shale gas replaces a higher carbon source of energy, there will be a net reduction in emissions. For example, there may be a reduction in emissions due to substitution of shale gas for imported Liquefied Natural Gas (LNG). A new Emissions Reduction Plan, expected in early 2017, will set out how shale gas is compatible with the emissions reduction targets, and should determine how much of the reserves may be exploited. The Government has acknowledged that there are currently insufficient measures in place to meet the existing carbon budgets²⁰.

If it is concluded that shale gas is compatible with reducing carbon consumption in this way, and that the points outlined above are met, then the case for fracking, as the process by which shale gas is extracted, becomes stronger. But then consideration must be given to regulating the process of fracking and establishing best practices such that the impact on local communities etc. (as distinct from the environmental impact of burning shale gas) is minimised.

Affordability of energy, Employment implications: Proponents of fracking maintain that it could employ many people especially in regions with high unemployment. Cuadrilla has estimated that a single test well would support some 250 FTE jobs in the UK for 12 months²¹. It is also claimed that fracking could lead to lower fuel bills for consumers, although there are many uncertainties and variables that could affect future fuel bills. As similar claims for the economy, employment and fuel bills are also made for renewable energy, it is hard to establish whether there would be any additional benefits from fracking per se.

Energy security: Being able to access many sources of energy supply enhances our energy security. Proponents of shale gas maintain that producing more natural gas in the UK would offer greater energy security in case supplies from abroad are disrupted.

Balance of Payments and tax gains: If UK-produced shale gas is substituted for imported carbon-based energy sources, it would be to the benefit of the balance of payments. It would also generate an additional tax-take for the Exchequer.

Government subsidies for fracking: The energy subsidy system is extremely complex, encompassing tax breaks and direct subsidies to consumers, the Capacity market, and under-pricing of social and environmental externalities (i.e. carbon emissions). If more relaxed planning regulations for shale wells were to be introduced, it could also be considered a form of subsidy.

3. Impacts of the processes of fracking

Community and environmental issues

Planning issues

The planning process is the formal means by which the range of stakeholder views, including those of local churches and communities, are heard. Proposals for shale gas exploration or extraction are subject to planning permission. Owners and tenants of land on the above ground area where works

¹⁹ DECC, 2016, "Onshore Petroleum: the compatibility of UK onshore petroleum with meeting the UK's carbon budgets. Government response to the Committee on Climate Change Report."

²⁰ Committee on Climate Change, 2016, Meeting Carbon Budgets – 2016 Progress Report to Parliament

²¹ Regeneris Consulting for Cuadrilla, 2011, "Economic Impact of Shale Gas Exploration and Production in Lancashire and the UK"

are proposed, must be consulted. Owners of land where solely underground operations may take place may be consulted as part of a wider obligation to consult the affected community although their consent is not required before extraction from below their land takes place²².

Fracking is treated in the planning system as any other kind of development. Some community concerns focus around noise, dust, traffic movements, dealing with waste products, impact on natural environment, eg nature reserves – issues the planning system is experienced in addressing. Protections and indemnities for communities can be negotiated to mitigate these effects. In future, the cumulative impacts of commercial scale production with many wells in various phases of development in relatively small areas (for example, water demand, pipelines, storage tanks) are potentially greater and will need careful scrutiny.

Other concerns focus on more complex environmental issues like water use, the risk of groundwater contamination, health fears and carbon emissions associated with the process of fracking itself contributing to climate change, which can partly be dealt with through regulation, although significant uncertainties remain about the long-term impacts. The contribution of fracking to the wider national energy strategy is not a consideration in planning terms.

In 2015 the Government announced that the Secretary of State for Communities and Local Government, rather than a planning inspector, will take the final decision on appeals relating to shale gas. In October 2016 the Communities Secretary took a decision on appeal to allow Cuadrilla to extract shale gas at two sites, which had previously been refused by Lancashire County Council. This decision could carry weight when future proposals for fracking are considered in the planning system, particularly given the high cost of planning appeals.

In the Autumn Statement 2015 the Chancellor announced the creation of a **Shale Wealth Fund** to deliver “up to £1 billion” of investment in local communities hosting shale gas developments. In August 2016 the Treasury launched a consultation on priorities for this fund, which could include direct payments to individual households, the outcome of which is currently awaited. The industry has set out its own Charter for community engagement and financial benefits to the community²³. Community benefit funds are a relatively common feature of large developments, including solar PV farms and onshore wind farms.

Health, safety and environmental issues

The British Geological Survey has identified the following potential environmental considerations associated with shale gas:²⁴

- carbon dioxide (CO₂) and methane (CH₄) emissions, particularly the potential for increased fugitive CH₄ emissions during drilling compared with drilling for conventional gas
- the volumes of water and the chemicals used in fracking and their subsequent disposal
- the possible risk of contaminating groundwater
- competing land-use requirements in densely populated areas
- the physical effects of fracking in the form of increased seismic activity

Groundwater contamination: Contamination of groundwater could potentially be caused by leakage through the vertical borehole, if well integrity is not ensured. The 2012 RS/RAE study concluded that because fracking takes place hundreds of metres below aquifers, it is unlikely that the underground

²² Town and Country Planning (Development Management Procedure and Section 62A Applications) (England) (Amendment no.2) Order 2013 (SI 2013/3194)

²³ United Kingdom Onshore Oil and Gas (UKOOG), 2016, Community Engagement Charter, <http://www.ukoog.org.uk/community/charter>

²⁴ British Geological Survey, 2016, <https://www.bgs.ac.uk/research/energy/shaleGas/environmentalImpacts.html>

hydraulic fracturing process itself will contaminate the aquifers²⁵. However, any surface spills of hydraulic fracturing fluids or wastewater may affect groundwater. In 2011, the then UK Government Energy Minister said that there was no evidence that “the fracking process itself poses a direct risk to underground water resources”, and that the UK would learn from US incidents of water pollution. The RS/RAE report called for the same stringent controls for fracking as apply for offshore wells. In this, as in other areas of potential risk, there is an obligation to put in place robust systems for managing and minimising risk.

Water use: excessive water use was highlighted by the Tyndall Centre²⁶ as a particular problem for the UK because of the pressure that water resources are under in some parts of the country. The disposal of waste water is also a concern. However, the UK Government said in January 2016, in response to a written question, that before permission was granted for carrying out fracking activities, “a thorough assessment will be made considering the existing water users’ needs and the environmental impact”.

Seismic events: Cuadrilla suspended fracking operations in Lancashire following small earth tremors near Blackpool in 2011. The tremors were on a scale which is not unusual in the UK. The BGS stated in 2012 that the risks to groundwater and of earthquakes had been exaggerated²⁷. The ban was lifted in December 2012, subject to new regulatory requirements.

Public health: Public health could be affected by groundwater contamination, emissions of methane, air quality, truck movements, flaring, treatment of waste, compressors, noise pollution, generators, drilling, etc. Public Health England concluded in 2014 that currently available evidence indicated that potential risk to public health from extraction of shale gas was low, provided operations are “properly run and regulated”²⁸.

The Royal Society and Royal Academy of Engineering concluded in 2012²⁹ that the health, safety and environmental risks could be managed effectively in the UK, by implementing and enforcing best operational practice. Where potential risks have been identified, they would be typically the result of operational failure and a poor regulatory environment. Therefore, good on-site management and appropriate regulation of all aspects including exploratory drilling, gas capture, use and storage of hydraulic fracturing fluid, and post-operations decommissioning are essential to minimise the risk to the environment and public health.

While experience of fracking in the UK to date is limited, most relevant bodies conclude that health, safety and environmental issues can be addressed by regulation and good operational practice. The Committee for Climate Change considers the UK regulatory regime to have the potential to be world-leading but that seamless management between the various regulators, and potentially the establishment of a dedicated regulatory body may be needed³⁰.

²⁵ Royal Society and Royal Academy of Engineering, 2012, “Shale Gas Extraction in the UK: a review of hydraulic fracturing”

²⁶ Tyndall Centre for Climate Change Research, 2011, “Shale gas: a provisional assessment of climate change and environmental impacts”

²⁷ British Geological Survey, 2012, “Fracking Risk is Exaggerated” New Scientist

²⁸ Public Health England, 2014, “Review of the Potential Public Health Impacts of Exposures to Chemical and Radioactive Pollutants as a Result of the Shale Gas Extraction Process”
<https://www.gov.uk/government/publications/shale-gas-extraction-review-of-the-potential-public-health-impacts-of-exposures-to-chemical-and-radioactive-pollutants>

²⁹ Royal Society and Royal Academy of Engineering, 2012, “Shale Gas Extraction in the UK: a review of hydraulic fracturing”

³⁰ Committee on Climate Change, 2016, “Onshore Petroleum: the compatibility of UK onshore petroleum with meeting the UK’s carbon budgets” <https://www.theccc.org.uk/publication/onshore-petroleum-the-compatibility-of-uk-onshore-petroleum-with-meeting-carbon-budgets/>

Fracking and conflict

Fracking has attracted a considerable amount of controversy and has tended to pit the interests of the industry, the concerns of local people in affected areas and the government's role in pursuing the national interest over against one another. The ways in which these conflicting interests have been handled has sometimes made it extremely difficult for reasonable negotiation or even mutual understanding to emerge.

It is clear that the way that industry, those concerned with the science, and some other agencies talk about questions of cost, benefit and risk does not always appreciate that the values underlying their assessments may not be shared by local communities whose values may be based on less tangible and less easily quantified considerations. It is important for all to understand that financial, and other straightforward measures of "value" rarely capture the range of things that people value in reality. Similarly, the discourse of some campaigning groups has sometimes failed to take full account of the interdependence of people in and beyond the affected areas and has sometimes been heard to carry echoes of the "not in my back yard" syndrome which may have been an excuse for other interest groups to ignore or marginalise local voices. It is important that the interests of one locality are weighed carefully against a wider conception of the Common Good – which is not to say that such a calculation is straightforward or easy. Good moral decisions cannot be made if those being asked to bear a cost on behalf of others are denied a proper voice. Campaigning groups have a vital role and will always feel they are challenging powerful forces difficult to hold to account.

There is also evidence of careful reflection on the Common Good on both sides of the issue – although the passion with which views are held has frequently obscured this aspect of the debate. In our view, the Committee on Climate Change report scores well in this regard.

The Church of England is a Christian presence in every community and local churches and clergy will be best placed to evaluate and deliver support to communities affected by (or likely to be affected by) fracking. The churches, which are committed to the pursuit of the Common Good, have a particular responsibility for defusing inflamed situations and seeking reconciliation – not in the sense of crude compromises but by enabling, where possible, different interest groups to hear what each other is really saying when the differences of style and vocabulary are allowed for. There are no guarantees that all can be satisfied by any single course of action, but the church seeks to build its ethical judgements on a thorough engagement with evidence – including evidence as seen from different vantage points. This paper seeks, however inadequately, to do just that.

CONCLUSIONS

1. The arguments and conclusions of the Committee for Climate Change Report provide a good base line for determining the facts on the impacts of UK shale gas exploitation on the UK's climate change commitments.
2. The theological chapter of the Ethical Investment Advisory Group's Climate Change policy provides the theological undergirding of this briefing paper. This is augmented by further theological work commissioned by the EIAG to inform its work on extractive industries which is, as yet, unpublished. We have not sought to repeat or reproduce this theological material in the current paper.

3. The case for and against fracking depends first on conclusions about the role of shale gas in a transitional energy policy. Shale gas is a potentially useful element in achieving a transition to a much lower carbon economy. The government's public commitment to reducing the UK's carbon emissions under COP21 provides a context which should ensure that shale gas is not treated as an alibi for ducking carbon reduction commitments. The Emissions Reduction Plan expected in early 2017 will have to demonstrate how carbon emissions from shale gas will balance those from other sectors of the economy, towards the UK's carbon targets.

3. Shale gas developments must not distract or delay efforts to expand low-carbon renewable energy, especially community-owned energy in the UK, towards achieving the long-term 2050 carbon reduction targets.

4. If such a possible limited role for exploiting shale gas in the UK is accepted, the next question is whether the impact of fracking, as the process whereby shale is exploited, on communities, the landscape and the environment, can be minimised satisfactorily.

5. The key to whether or not fracking is a morally acceptable practice thus turns on three points: the place of shale gas within a transitional energy policy committed to a low carbon economy; the adequacy and robustness of the regulatory regime under which it is conducted, and the robustness of local planning and decision-making processes. Having concluded that shale gas may be a useful component in transitioning to a low carbon economy, we are persuaded that a robust planning and regulatory regime could be constructed. However, these are aspects that will need constant vigilance. Ongoing research and monitoring of impacts on health and environment will be needed.

6. We recognise and sympathise with the concerns of individuals and communities who are directly affected by fracking activities in their neighbourhoods. It is essential that their legitimate concerns are heard and appropriate protections and compensation are in place. Many communities are asked to accept disadvantage for the sake of the good of society at large but it is not right that this should be a one-way transaction – extractive industries cannot put back what they have extracted so they must seek ways to put back resources into communities in other ways.

This briefing paper was commissioned by the Mission and Public Affairs Council, and the Environment Working Group, to help understand a "live", and contentious, issue about which there are many strong feelings on different sides, both in the church and in the wider community. Following discussion of the paper in draft, both groups have found it helpful and representative of both groups' current thinking. It is therefore offered to others in the church, and beyond, as a resource for ongoing, evidence-based, discussion.

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APPENDIX 1 – FRACKING SITES IN UK AT OCTOBER 2016

A map of the areas currently licenced for shale gas exploration and extraction can be found here:

<https://www.ogauthority.co.uk/data-centre/interactive-maps-and-tools/>

Fracking Site	County / Diocese	Company	Position at Oct 2016
Preese Hall	Lancashire		Fracking in 2011 caused small earthquakes near the site, leading to a moratorium on fracking which was lifted in 2012
Balcombe	Sussex / Chichester	Cuadrilla	Protests over test drilling in 2013 led to work being halted temporarily. New planning application 2014 gave temporary permission for exploration. No activity currently.
Preston New Road	Lancashire	Cuadrilla	Application recommended for approval by planning officers, rejected by Councillors. Overturned on appeal by Secretary of State, approval granted Sept 2016. Test drilling will start earliest April 2017.
Roseacre Wood	Lancashire	Cuadrilla	Planning inspectors and appeal planning inspector recommended against approval. In Sept 2016, Secretary of State gave company more time to improve approach to road safety concerns.
Kirby Misperton	Ryedale, North Yorkshire	Third Energy	Approved in May 2016 by North Yorkshire County Council. Friends of the Earth and Frack Free Ryedale now applied for judicial review; High Court hearing in Nov 2016.
Misson	Nottinghamshire	IGas	Planning approved for drilling and exploration; further planning application needed for fracking
Forest of Dean	Gloucestershire	South Western Energy	Local protests resulted in the company pulling out of 2 licencing blocks, although its interests in another two blocks remain.
Horse Hill	Surrey / Guildford	UK Oil and Gas	Exploration in 2014 showed shale gas formations. New planning application submitted
Tinker Lane	Blyth, Nottinghamshire	Dart Energy	Planning application submitted
30 sites		Ineos	Plans to submit 5 planning applications by end 2017, and a further 25 in 2018