A FUTURE OF FRACKING?

WHY GOVERNMENT SUPPORT FOR SHALE GAS EXTRACTION DOES NOT MAKE CLIMATE SENSE

FRACKING

#CLIMATE SENSE

Green Party
for the common good

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EXECUTIVE SUMMARY

Fracking has become an explosive topic in recent years. The Government is demonstrating its support for the shale gas industry, precisely at a time when the UK should be showing real action to reduce our dependency on fossil fuels by meeting our emissions reducing targets. The fundamental question is: does fracking make climate sense?

With the UK due to take part at the Paris Climate Conference at the end of this year, during which nations will be called on to show commitments to reducing emissions, the UK Government must get real on climate change. As part of our Climate Sense Campaign, the Green Party is calling for the Government to support our call for the UK's energy supply to come from 100% renewable sources, and in so doing that the UK be protected from fracking. We say that:

- The UK should be frack-free, and that current plans to frack should be overturned.
- By standing for renewable energy sources, and against fracking, the UK can contribute credibly to an international effort to combat climate change.

As an EU member, in the run-up to the Paris talks the UK has pledged to reduce domestic EU greenhouse gas emissions by at least 40% below 1990 levels by 2030.[1] However, current UK Government policies are side-lining emission reducing strategies. In particular, the Government is hand in hand with shale gas extraction companies, and is drafting legislation that gives way to a future of fracking. Such a double-standard approach to energy does not make climate sense.

Fracking has a climate footprint that may be up to twice as great as that of coal. The process excretes large volumes of methane, a dangerous contributor to climate change. Additionally, fracking puts our communities in jeopardy as people's water supplies and food supplies can become contaminated.

The Green Party is taking action for a safe climate without fracking on a local, national and parliamentary level. Local Green Parties, from Lancashire to Balcombe, are calling on local councils to take a stand against dangerous fracking. Caroline Lucas MP is holding Government to account on its liaisons with shale gas companies, and Jenny Jones AM and Darren Johnson AM are consistently holding the London Mayor to account on his support for fracking. Together, we are making the case for a frack-free UK, fuelled by safe, clean and renewable energy sources.

The Green Party is calling on people across the UK to support our call to curb fracking plans. Anyone can take part in our campaign, by:

- Getting in touch with their MP, calling for them to take a stand against fracking.
- Becoming active locally by demonstrating against fracking sites, and by asking councillors to vote against fracking plans.

This report will outline the UK's climate change commitments, and how fracking contradicts these. It will be discussed that the Government's plans to frack do not make climate sense.

1 Simon Evans, How ambitious is the EU's offer to the Paris climate change talks?, 10 March 2015: http://www.carbonbrief.org/blog/2015/03/how-ambitious-is-the-eus-offer-to-the-paris-climate-change-talks/ and PBL Netherlands Environmental Assessment Agency, PBL Climate Pledge INDC tool, 8 September 2015: http://infographics.pbl.nl/indc/

INTRODUCTION:

WHAT ARE THE UK'S CLIMATE CHANGE COMMITMENTS?

Under the Climate Change Act 2008, the UK is committed to reducing carbon emissions by at least 80% of 1990 levels by 2050.[2]

The Act also requires the Government to set legally-binding carbon budgets for each five year period leading to 2050. (In spite of the name these capture all six greenhouse gas emissions[3] included in the international Kyoto agreement but all are converted into equivalent tonnes of carbon dioxide.)

Carbon budgets are set with a view to charting a manageable, cost-effective path towards meeting the 2050 target. They must take into account a range of factors including: scientific knowledge about climate change; technology availability; economic and fiscal impacts; social and poverty impacts; impacts on energy supply; international and European circumstances.[4]

The first carbon budgets were brought into law in the 2009 budget. This budget also established a legally binding interim target of a 34% reduction in emissions by 2020 compared with 1990 levels.[5]

So far, carbon budgets for the period to 2027 have been put into law. These commit the UK to a 35% reduction in emissions (compared with 1990 levels) by 2020 and a 50% reduction by 2025 (see table 1 below for details).

This is also in line with a binding EU-wide target, agreed in 2014 by EU Heads of State, to reduce greenhouse gas emissions by 40% on 1990 levels by 2030.[6]

The main target of the Climate Change Act (an 80% reduction in emissions on 1990 levels by 2050) cannot be changed without repealing the Act[7], but the interim carbon budgets can be legally amended if there have been 'significant changes affecting the basis on which the decision was made' since targets were set.[8]

In 1990 the UK emitted approximately 779.9 Megatonnes (Mt) of CO_2 equivalent (CO_2e). Meeting legally binding targets would therefore mean that annual emissions must fall to approximately:

- 515 $MtCO_2e$ per year by 2020; and
- 160 $MtCO_2e$ per year by 2050.

However these figures are subject to change as estimates of 1990 emissions are revised each year.

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2 Committee on Climate Change website, Carbon budgets and targets: https://www.theccc.org.uk/tackling-climate-change/reducing-carbon-emissions/carbon-budgets-and-targets/

3 Carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride.

4 Climate Change Act 2008: 10. Matters to be taken into account in connection with carbon budgets: http://www.legislation.gov.uk/ukpga/2008/27/section/10

5 HM Treasury, Budget 2009: http://webarchive.nationalarchives.gov.uk/20100407010852/http:/www.hm-treasury.gov.uk/d/bud09_completereport_2520.pdf

6 European Commission press release, 24 October 2014: http://ec.europa.eu/clima/news/articles/news_2014102401_en.htm

7 The Carbon Brief, Can the Government legally change the fourth carbon budget, 9 December 2013: http://www.carbonbrief.org/blog/2013/12/can-the-government-legally-change-the-fourth-carbon-budget-(1)

8 Climate Change Act 2008: 21. Alteration of carbon budgets: http://www.legislation.gov.uk/ukpga/2008/27/section/21

The UK's carbon budgets

Carbon budgets from 2008 to 2027 are as follows[9,10]:

		Carbon budget level (totals for budget periods) ($Mt CO_2e$)	Equivalent average annual emissions ($Mt CO_2e$)	% reduction below 1990
2008-12	(1st budget)	3,018	603.6	23%
2013-17	(2nd budget)	2,782	556.4	29%
2018-2022	(3rd budget)	2,544	508.8	35% by 2020
2023-2027	(4th budget)	1,950	390.0	50% by 2025

The 4th carbon budget is considerably more ambitious than the first 3 carbon budgets, and will require more of a step change to a lower carbon economy.

The 4th carbon budget (for the period 2023-2027) was reviewed in 2014 and was left unchanged,[11] in spite of speculation that George Osborne would seek to water it down to allow new gas projects.[12] The review was intended to consider whether the UK's rate of emissions cuts was in in line with EU action on climate change.

The Committee on Climate Change assessed whether there had been significant changes which would justify a change in the budget, and concluded that there had not. Ed Davey, then Energy and Climate Change Secretary, stated that 'it is clear that the evidence does not support amending the budget'.[13]

The 2015 Conservative Party manifesto committed to *'meet our climate change commitments'* and *'continue to support the UK Climate Change Act'*.[14]

It also stated that the Conservatives *'will cut emissions as cost-effectively as possible, and will not support additional distorting and expensive power sector targets'*.[15]

How were these targets set?

Both the overall target and the five-year carbon budgets are based on advice from the independent Committee on Climate Change. The Committee was established under the Climate Change Act 2008 to provide independent advice on setting and meeting carbon budgets, and to monitor progress in reducing emissions.[16] It is made up of seven independent experts in the fields of climate change, science and economies.[17]

The Committee states that the 2050 target represents 'an appropriate UK contribution to global emission reductions consistent with limiting global temperature rise to as little as possible above 2 degrees Celsius'.[18]

This is slightly less stringent than the target agreed internationally in Cancun in 2010, through the United Nations Framework Convention on Climate Change (UNFCCC) that commits governments to ensuring a 'maximum temperature rise of 2 degrees Celsius above pre-industrial levels'.[19]

9 Committee on Climate Change website, Carbon budgets and targets: https://www.theccc.org.uk/tackling-climate-change/reducing-carbon-emissions/carbon-budgets-and-targets/

10 Department of Energy & Climate Change, UK progress towards GHG emissions reduction targets, 19 March 2015: https://www.gov.uk/government/uploads/system/uploads/attachment_data/fi le/414241/20150319_Progress_to_emissions_reductions_targets_fi nal.pdf

11 The Carbon Brief, Government decides not to amend fourth carbon budget, 22 July 2014: http://www.carbonbrief.org/blog/2014/07/government-decides-not-to-amend-uk%E2%80%99s-fourth-carbon-budget/

12 The Carbon Brief, Gas strategy: government could loosen carbon budgets to allow dash for gas, 5 December 2012: http://www.carbonbrief.org/blog/2012/12/gas-strategy-would-ramp-up-construction-by-loosening-carbon-budgets

13 Liberal Democrat press release, 22 July 2014: http://www.libdems.org.uk/global_warming_lib_dems_win_fight

14 Conservative Party manifesto 2015: https://s3-eu-west-1.amazonaws.com/manifesto2015/ConservativeManifesto2015.pdf

15 Ibid

16 Committee on Climate Change website, About us: https://www.theccc.org.uk/about/

17 Committee on Climate Change website, Membership of the Committee: https://www.theccc.org.uk/about/structure-and-governance/committee-on-climate-change/

18 Committee on Climate Change website, Carbon budgets and targets: https://www.theccc.org.uk/tackling-climate-change/reducing-carbon-emissions/

19 UNFCCC, The Cancun Agreements, November 2010: http://unfccc.int/meetings/cancun_nov_2010/meeting/6266.php

The 2 degrees threshold has been agreed not because this temperature rise is considered safe (it is still expected to cause increases in mortality, increased extreme weather events, and the loss of glaciers), but because it is a challenging yet achievable target that was thought to be the threshold to avert the most catastrophic impacts.

The Committee calculated the emissions reductions necessary at a global level to achieve this temperature goal, and then calculated the UK's fair share of the total based on its share of the global population.[20]

The five-year budgets are designed to 'reflect the most cost-effective path to achieving the long term objectives'[21] with consideration given to social and economic impacts as outlined above. This means that they aim to make sure that there are continual efforts to reduce emissions, while allowing the transition to a lower-carbon economy to be made in a planned way that does not require the replacement of vast amounts of infrastructure overnight.[22]

Carbon budgets are developed following detailed sector by sector analysis of options to reduce emissions at least cost.

Carbon budgets have been developed assuming that this target will be met, so if it is not met then greater emissions reductions will be needed elsewhere.

Many have criticised the carbon budgets for not being ambitious enough. Friends of the Earth believes that the 80% reduction target should be achieved by 2030 not 2050, for the UK to 'do its fair share in tackling global climate change'.[23]

At the moment, as will be seen below, not enough progress in emissions reductions is being made to meet the current targets, let alone something bolder.

How does progress since 2008 measure up?

The UK met its first carbon budget successfully, with emissions falling steadily from 648.9 Mt CO_2e in 2008 to 583.1 Mt CO_2e in 2012.[24]

The Committee on Climate Change also reported in June 2015 that the UK was on track to meet the 2nd and 3rd carbon budgets.[25]

However, there is no room for complacency. So-called 'progress' to date is largely a side-effect of the recession which reduced overall economic activity, rather than a shift to lower carbon economy.

The Committee has voiced significant concerns about the rate of progress in adopting low-carbon measures, noting that[26]:

- Most of the emissions reductions so far have been a side-effect of the recession.
- Some reductions have been achieved by reducing coal use in the power sector but there has been little progress across other sectors.
- Meeting future carbon budgets will require reducing emissions by at least 3% a year, and the underlying rate of emissions reduction due to low-carbon measures lags far behind this.
- In 2011, for example, greenhouse gas emissions fell overall by 7%. But less than 1% of this was due to the adoption of emissions reduction measures. The rest was due to mild winter temperatures (meaning less need for heating), rising energy prices (constraining demand), falling real incomes (reducing economic activity in general) and short-term changes in the energy mix.

The Committee's June 2015 report stresses that more widespread changes will be needed across the economy in future years.

To meet the fourth carbon budget (2023-27), and ultimately the 2050 target, 'significant action' is needed.

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20 Committee on Climate Change website, Setting a target for emission reduction: https://www.theccc.org.uk/tackling-climate-change/the-science-of-climate-change/setting-a-target-for-emission-reduction/

21 Committee on Climate Change website, The Climate Change Act and UK regulations: https://www.theccc.org.uk/tackling-climate-change/the-legal-landscape/global-action-on-climate-change/

22 Committee on Climate Change website, Carbon budgets and targets: https://www.theccc.org.uk/tackling-climate-change/reducing-carbon-emissions/carbon-budgets-and-targets/

23 Friends of the Earth website, UK climate campaign: https://www.foe.co.uk/page/uk-climate-campaign

24 Department of Energy & Climate Change, UK progress towards GHG emissions reduction targets, 19 March 2015: https://www.gov.uk/government/uploads/system/uploads/attachment_data/fi le/414241/20150319_Progress_to_emissions_reductions_targets_fi nal.pdf

25 Committee on Climate Change, Meeting carbon budgets: progress in reducing the UK's emissions, June 2015: https://www.theccc.org.uk/wp-content/uploads/2015/06/6.737_CCC-BOOK_WEB_030715_RFS.pdf

26 Committee on Climate Change website, How the UK is progressing: https://www.theccc.org.uk/tackling-climate-change/reducing-carbon-emissions/how-the-uk-is-progressing/

Do the government's latest plans make climate sense?

Friends of the Earth says that 'the Government's plan to meet existing budgets is way off course' and that 'the Government needs to toughen climate policy across all sectors of the economy'.[27]

The Government has been heavily criticised by environmental organisations for its decision to scrap subsidies for onshore wind and commercial solar (the two cheapest forms of renewable energy), slashing energy efficiency budgets, lowering taxes on polluting firms and introducing a tax on clean energy.[28]

These actions are simply not in line with legally-binding emissions reductions targets, the UK's EU obligations, and most important the urgent need to act on climate change before it is too late. The Government says it is committed to implementing the Climate Change Act, but its actions speak louder than its words.

27 Friends of the Earth website, UK climate campaign: https://www.foe.co.uk/page/uk-climate-campaign

28 BBC News, Energy Secretary Amber Rudd criticised ahead of climate speech, 24 July 2015: http://www.bbc.co.uk/news/science-environment-33638495

FRACKING

With the crucial UN Climate Change Conference taking place in Paris at the end of this year, the UK should be making strides to implement policies to reduce greenhouse gases and demonstrate a commitment to international efforts to tackle climate change. In order to avoid dangerous climate change, the world cannot burn more than a tiny fraction of existing fossil fuel reserves. Many institutions recognise this fact– from the International Energy Agency, to the Bank of England to fossil fuel companies such as Shell and BP.

Yet the Government is demonstrating a determination to continue high levels of emissions by extracting fossil fuels through hydraulic fracturing for shale gas, or 'fracking'. Over the last decade, the amount of gas the UK has imported from other countries has steadily increased. Britain gets much of its gas from other countries, but the Government now plans to increase the amount of gas extracted in the UK through fracking. This commits the UK to fossil fuel infrastructure for years to come, precisely at a time when we are supposedly committed to phasing out fossil fuels, as mandated by legislation and international agreements.

The United Nations says that fracking may result in unavoidable environmental impacts even if unconventional gas is extracted properly, and more so if done inadequately. Furthermore, they stress that increased extraction and use of unconventional gas is likely to be detrimental to efforts to curb climate change.[29] At a time when we should be focussing on moving to 100% renewable energy, plans to frack look set to continue the UK's disproportionate contribution to climate change.

What is fracking?

Fracking is the extraction of shale gas from beneath the ground. The process involves blasting water, sand and chemicals into dense shale rocks using high pressure jets, allowing for microscopic bubbles of natural gas to be extracted from tiny fissures in the rock. This natural gas is then captured and piped to the surface.

Fracking continues to be a contentious issue for many, attracting organisational and community opposition around the country on the grounds of environmental, climate change and safety risks. A poll by Co-operate Energy into renewable energy found that just 2% of the public support shale gas extraction as a method of energy generation.[30] Communities around the country have raised their voices and protested against plans to frack on their doorsteps, with community-led movements in Lancashire and Balcombe, West Sussex, hitting headlines in recent months and years. Caroline Lucas MP made her position clear when joining in protests against fracking at Balcombe in 2013. Caroline said:

Additionally, Green Party councillors continue to show opposition to fracking. For example, the Lancashire Green Party have been active in opposing fracking in the region. Following:

> 'Along with everyone else who took action today, I'm trying to stop a process which could cause enormous damage for decades to come. The evidence is clear that fracking undermines efforts to tackle the climate crisis and poses potential risks to the local environment.'[1]

Additionally, Green Party councillors continue to show opposition to fracking. For example, the Lancashire Green Party have been active in opposing fracking in the region. Following years of campaign work, the local council voted to reject fracking in June this year. Green Councillor Gina Dowding said:

> 'Today is a day for celebrating. The county councillors on the committee have listened to the concerns of Lancashire's residents and have done what is right. They have given voice to thousands of residents, campaign groups, health experts and all those concerned about climate change. But the party may not last long. As we all know, the fracking industry is out to make a quick buck in Lancashire and I doubt they will give up that easily. However Lancastrians have shown they will not be dictated to by the Government or big business and will fight hard to protect our county and our future.'[1]

29 UNEP(UN Environment Program) (2012) 'Gas fracking: can we safely squeeze the rocks?' http://www.unep.org/pdf/UNEP-GEAS_NOV_2012.pdf

30 The Community Energy Coalition website, Overwhelming support for 'backyard' renewable energy schemes, survey finds, 4 September 2015: http://www.ukcec.org/overwhelming-support-%E2%80%98backyard%E2%80%99-renewable-energy-schemes-survey-finds

However, the Conservative Party set out its commitment to shale gas extraction in its 2015 General Election manifesto.[31] Ministers have laid out plans to give the Government new powers to step in if local councils do not speed up the fracking application process.[32] They have extended the number of sites available for licensing to the fracking industry, including wildlife reserves.[33]

The question is whether accelerating fracking is compatible with the UK's greenhouse gas reducing targets.

Climate impacts of fracking and developing the fossil fuel industry

As stressed by Friends of the Earth, fracking in the UK is not compatible with tackling climate change.

Some argue that fracking can replace coal for energy generation. But unabated coal-fired power generation is already due to be phased out under EU directives, and it could be 15 years until large scale shale gas extraction is under way in the UK. According to energy expert Professor Paul Stevens of Chatham House, 'if the [shale gas] revolution fails to deliver a lot of cheap gas, by the time this is realized it could well be too late to revert to a solution to climate change based upon renewables.'[34] This conclusion was corroborated by the cross-party Environmental Audit Committee, which includes Caroline Lucas as a member.[35]

Friends of the Earth also point out that the world already has five times the amount of fossil fuels in reserves that can be safely burnt, and extracting shale gas through fracking will only add to this 'unburnable carbon' problem.[36]

However, the Government's suggestion that shale gas is 'the greenest fossil fuel' is put into question by a 2011 report published in the journal 'Climate Change' which confirms that 'Compared to coal, the footprint of shale gas is at least 20% greater and perhaps more than twice as great.'[37]

Furthermore, research conducted by the Department of Energy and Climate Change (DECC) suggests that emissions produced by shale gas can be up to 4.5% higher than those produced by electricity production from conventional gas.[38] A Tyndall report confirmed: 'Shale gas exploitation could lead to an increase in atmospheric concentration of CO2, occupying up to 29% of a 2°C emissions budget.'[39] Exploiting the world's reserves of unconventional gas, such as shale gas, could lead to a global temperature rise of 3.5 degrees Centigrade. Professor David Mackay, chief scientist at the DECC said, 'without global climate policies … new fossil fuel exploitation is likely to lead to an increase in cumulative GHG emissions and the risk of climate change.'[40]

Additionally, it cannot be guaranteed that there will not be methane gas leakage during large-scale extraction of shale gas. Indeed, in practice it has been shown that high levels of methane are vented in the process.[41] Such 'fugitive methane' is even more damaging to the climate than carbon dioxide. There is not enough evidence to suggest that high levels of fugitive methane would not be dangerous, and as such it cannot be concluded that fracking produces fewer harmful emissions than coal, as has been suggested. Once methane is released, within a 20 year timeframe it has a potential impact on global warming that is 72 times more dangerous than carbon dioxide. With this in mind, over a 20 year horizon, shale gas can produce more greenhouse gas emissions than coal, the fossil fuel that fracking is praised by the UK Government as the 'greener' alternative to.[42]

31 Conservative Party manifesto 2015: https://s3-eu-west-1.amazonaws.com/manifesto2015/ConservativeManifesto2015.pdf

32 Greg Clark, Planning for Onshore Oil and Gas: Written statement- HCWS201, 16 September 2015: http://www.parliament.uk/business/publications/written-questions-answers-statements/written-statement/Commons/2015-09-16/HCWS201/

33 The Wildlife Trusts website, Fracking & wildlife: http://www.wildlifetrusts.org/Fracking

34 Paul Stevens, The 'Shale Gas Revolution': Developments and Changes August 2012: https://www.chathamhouse.org/sites/files/chathamhouse/public/Research/Energy,%20Environment%20and%20Development/bp0812_stevens.pdf

35 Friends of the earth, Fracking the climate, September 2015: http://www.foe.co.uk/sites/default/files/downloads/why-uk-fracking-not-compatible-with-tackling-climate-change-86338.pdf

36 Ibid

37 Richard Black, Shale gas 'worse than coal' for climate, 12 April 2011: http://www.bbc.co.uk/news/science-environment-13053040

38 Friends of the Earth, Fracking the climate, September 2015: http://www.foe.co.uk/sites/default/files/downloads/why-uk-fracking-not-compatible-with-tackling-climate-change-86338.pdf

39 John Broderick, Kevin Anderson, Ruth Wood, Paul Gilbert, and Maria Sharmina, Shale gas: an updated assessment of environmental and climate change impacts, November 2011: http://www.tyndall.ac.uk/sites/default/files/coop_shale_gas_report_update_v3.10.pdf

40 Department of Energy and Climate Change, 'Potential Greenhouse Gas Emissions Associated with Shale Gas Extraction and Use', 9 September 2013: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/237330/MacKay_Stone_shale_study_report_09092013.pdf

41 UNEP Global Environmental Alert Service, Resource Efficiency, Harmful Substances and Hazardous Waste, November 2012: http://www.unep.org/pdf/UNEP-GEAS_NOV_2012.pdf

42 Ibid

In addition, emissions are produced as an indirect result of fracking operations. An EU report found that, 'Drilling operations can lead to air emissions from: 1) diesel exhaust fumes from drill rig engines and site electricity generation; 2) fuel storage tanks; and 3) truck activities near the well pad'.[43]

A further impact of particular climate concern is that investment in fracking could detract from interest in renewable energy sources which would form the basis of a low carbon economy.[44] Furthermore, an Imperial University study found that a focus on fracking could distract from efforts to increase energy efficiency.[45]

43 Dr Mark Broomfield, Support to the identification of potential risks for the environment and human health arising from hydrocarbons operations involving hydraulic fracturing in Europe, 10 August 2012: http://ec.europa.eu/environment/integration/energy/pdf/fracking%20study.pdf

44 John Broderick, Kevin Anderson, Ruth Wood, Paul Gilbert, and Maria Sharmina, Shale gas: an updated assessment of environmental and climate change impacts, November 2011: http://www.tyndall.ac.uk/sites/default/files/coop_shale_gas_report_update_v3.10.pdf

45 Neil Hirst, Dr Cheng Seong Khor and Dr Simon Buckle, Shale gas and climate change, October 2013: http://www.imperial.ac.uk/media/imperial-college/grantham-institute/public/publications/briefing-papers/Shale-gas-and-climate-change---Grantham-BP-10.pdf

Other environmental impacts

Fracking industrialises the countryside, and in so doing, brings with it damaging environmental consequences.

As shown by examples of shale gas extraction in the United States, leakage of contaminated water that comes about as a result of the drilling process, can have major environmental impacts. Surface water contaminated by fracking can have a detrimental effect on agriculture, affecting both livestock and products.

In more detail, a report by scientist Philip Lightowlers outlining the polluting effects of fracking concluded: 'Fracking fluids contain a mixture of chemicals that may be persistent, bioaccumulative and toxic. The mixture may include carcinogens, mutagens, water pollutants, reproductive toxicants and endocrine disruptors. Flowback can contain any of these ingredients plus a high concentration of salts, heavy metals, hydrocarbons from the rocks and significant levels of naturally occurring radioactive material.'[46]

A major concern surrounding the environmental effects of fracking, is the detrimental impact it could cause to sensitive wildlife sites, as highlighted by RSPB. The organisation has stressed that fracking at sensitive wildlife sites could cause disruption, habitat loss and fragmentation. Bird populations could also be affected by light and noise pollution, and changes in water supplies. 1000 square miles of important land for wildlife in England has been opened up to fracking, putting hundreds more species of wildlife at risk. These sites represent sensitive habitats for many species of wildlife.[47]

In addition, minor earthquakes have been produced as a result of fracking exploration in Lancashire, to date the only site in the UK where drilling has taken place.[48]

There is also concern that the liabilities and planning for the large amounts of 'scarce' silica sand needed to support unconventional gas extraction has not been duly considered. The most likely sources for the future production of frack sand in the UK are the Upper Carboniferous sandstones in the Midland Valley of Scotland, the Lower Cretaceous sands and sandstones of eastern and southern England and the Pleistocene sands of Cheshire.[49] The experience from production in the US is that each well would require in the order of 2,000 to 10,000 tonnes frack sand depending on the length of the well and the number of fracking treatments. It is estimated that the demand for frack sand in the UK could be as little as 10,000 tpa or as large as 380,000 tpa, depending on the amount of fracking carried out.[50]

The Health and Safety Executive drew attention to an increased cancer burden in those working in the silica extraction sector compared to regular construction work.[51] The National Institute for Occupational Safety and Health (NIOSH) in the USA identified exposure to airborne silica as a health hazard to workers conducting some hydraulic fracturing operations during recent field studies.[52]

Moreover, fracking can have negative consequences for the social environment. A DEFRA report on fracking confirms the negative social impacts of fracking. On human health, the DEFRA report also confirmed: 'There is a risk that even if contaminated surface water does not directly impact drinking water supplies, it can affect human health indirectly through consumption of contaminated wildlife, livestock or agricultural products.' Friends of the Earth have spoken out saying that the published version of this report was initially so redacted that it hid from the public the true extent of the damage of fracking.

46 Philip J Lightowlers, Chemical pollution from fracking, February 2015: http://www.chemtrust.org.uk/wp-content/uploads/chemtrust-chemical-pollution-from-fracking-june2015.pdf

47 Fiona Harvey, New wave of fracking licences threatens hundreds of key English wildlife sites, 16 September 2015: http://www.theguardian.com/environment/2015/sep/16/new-wave-of-fracking-licences-threatens-hundreds-of-key-english-wildlife-sites

48 Juliette Jowit and Hanna Gersmann, Fracking 'probable' cause of Lancashire quakes, 2 November 2011: http://www.theguardian.com/environment/2011/nov/02/fracking-cause-lancashire-quakes

49 Hampshire, Portsmouth, Southampton, New Forest National Park & South Downs National Park, Mineral and Waste Plan: http://documents.hants.gov.uk/mineralsandwaste/HampshireMineralsWastePlanADOPTED.pdf (Section 2.17)

50 CJ Mitchell, UK Frac Sand Resources, Strict specifications: UK frac sand potential, June 2015: http://nora.nerc.ac.uk/510894/1/Strict_Specifications_UK_frac_sand_potential.pdf

51 United States Department of Labor website, Worker Exposure to Silica during Hydraulic Fracturing:https://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.html

52 NIOSH, Worker Exposure to Silica during Hydraulic Fracturing. Accessed 27July from https://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.html

Do the government's latest plans make climate sense?

Worryingly, the Government appears to be cheerleading for the fracking industry and providing tax breaks for oil and gas. As an example, it was announced in January this year that the Government would provide £2m of funding for companies to develop technologies for fracking. Matt Hancock, the former Minister for Business, Enterprise and Energy, said: 'Unlocking the shale gas and oil that is deep underground is an opportunity to reduce carbon emissions, increase our energy security and create jobs. It must be done safely and securely, so supporting innovation in this sector is vital to help us seize this opportunity.'[53] This support comes despite warnings of the climate and environmental impacts of fracking.

On fracking, the government says: 'shale gas has the potential to provide the UK with greater energy security, growth and jobs. We are encouraging safe and environmentally sound exploration to determine this potential.'[54] Although enormous investment in shale gas will create jobs, US experience shows that job creation is often overstated.[55] Key existing economic sectors such as agriculture and tourism can also suffer. Energy efficiency and renewable energy could provide thousands of jobs; Friends of the Earth say that renewable energy alone could support 400,000 jobs.[56]

Additionally, DECC claims: 'Shale gas is part of Government's plan to tackle climate change. As the greenest fossil fuel, gas has half the emissions of coal in electricity generation.'[57] The National Grid has highlighted governmental plans, setting out a prediction that 15-20% of the UK's gas could be attributed to shale by 2025.[58] In the government's 2014 Autumn Statement plans were set out to 'establish a new £5 million fund for shale exploration to provide independent evidence directly to the general public about the robustness of the existing regulatory regime.'[59] As part of this fund, the DECC has been allocated £1.7m for 2015-16 to explore potential fracking sites.

Additionally, the government is incentivising the business of fracking. In 2013 George Osborne offered tax breaks to energy companies to explore shale gas in the UK.[60] As a further example of the government teaming up with fracking companies, Energy and Climate Change Secretary, Amber Rudd, took a recent trip to the US alongside chemicals company Ineos, to explore shale gas extraction.[61]

The Task Force on Shale Gas, chaired by Lord Smith and funded by the fracking industry, says shale gas can thrive alongside renewables. It claims that if fracking is adequately regulated, it should be safe for both people and wildlife. In addition, the taskforce claims that fracking in the UK would not affect targets to combat climate change. But UK public officials have been collaborating in private with shale gas executives to manage public complaints about fracking. These have included plans for gas to be used for another four decades.[62]

Governmental support for fracking is pressing ahead, despite warnings from the Environmental Audit Committee. In January 2015, Committee called for fracking to be indefinitely put on hold. The Committee called for the Infrastructure Bill to be amended to 'explicitly bar fracking of shale gas'. In response to this, the DECC said 'We disagree with the conclusion of this report. We have one of the most robust regulatory regimes for shale gas. UK shale development is compatible with our goal to cut greenhouse gas emissions.'[63]

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53 Business Green, New £2m fund targets 'sustainable shale', 15 January 2015: http://www.businessgreen.com/bg/news/2390247/new-gbp2m-fund-targets-sustainable-shale

54 Department of Energy & Climate Change website, Guidance on fracking: developing shale oil and gas in the UK, 13 August 2015 https://www.gov.uk/government/publications/about-shale-gas-and-hydraulic-fracturing-fracking/developing-shale-oil-and-gas-in-the-uk

55 Research for Cuadrilla shows the number of jobs created from 2016 to 2019 in Lancashire to be around 1,600, and 5,600 in the UK, falling to under 200 from 2022 onwards. Regeneris Consulting, Economic impact of shale gas exploration & production in Lancashire and the UK, September 2011: http://www.cuadrillaresources.nl/wp-content/uploads/2012/02/Full_Report_Economic_Impact_of_Shale_Gas_14_Sept.pdf

56 Friends of the Earth, Briefing note, May 2013: http://www.foe.co.uk/sites/default/files/downloads/fracking_summary_2013.pdf

57 Department of Energy & Climate Change, shale gas made simple, 2014: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/374718/Shale_in_Plain_English_booklet_Web_Final.pdf

58 Karl Mathiesen, Is a fracking revolution the way to cut UK carbon Emissions?, 11 September 2015: http://www.theguardian.com/environment/2015/sep/11/is-a-fracking-revolution-the-way-to-cut-uk-carbon-emissions

59 Department of Energy & Climate Change website, Guidance on fracking: developing shale oil and gas in the UK, 13 August 2015: https://www.gov.uk/government/publications/about-shale-gas-and-hydraulic-fracturing-fracking/developing-shale-oil-and-gas-in-the-uk

60 The Carbon Brief, A summary of climate and energy announcements in the Autumn statement 2014, 3 December 2014: : http://www.carbonbrief.org/blog/2014/12/a-summary-of-climate-and-energy-announcements-in-the-autumn-statement-2014/

61 David Hellier, Jim Ratcliffe: 'Fracking can be done safely. A lot of opposition is based on hearsay', 12 September 2015: http://www.theguardian.com/environment/2015/sep/12/jim-ratcliffe-ineos-fracking-done-safely-opposition-hearsay

62 Damian Carrington, Emails reveal UK helped shale gas industry manage fracking opposition, 17 January 2014: http://www.theguardian.com/environment/2014/jan/17/emails-uk-shale-gas-fracking-opposition

63 Emily Gosden, Fracking: MPs demanding ban 'listened to ill-informed green groups not science', 26 January 2015: http://www.telegraph.co.uk/news/earth/energy/fracking/11368632/Fracking-MPs-demanding-ban-listened-to-green-campaigners-not-science.html

Additionally, the government is aware of popular opposition to fracking. In an attempt to appease local residents near potential fracking sites, the government approved proposals for 'community benefits' to be introduced by extraction companies. Last year David Cameron announced plans to incentivise communities and local councils to support fracking.[64] Caroline Lucas MP has criticised the Government's promotion of fracking, saying: 'The Government's dash for gas is deeply irresponsible, because it will fatally undermine our hopes of tackling climate change and increase the risk of higher energy bills.'[65]

Comparison with other countries

The US environment has suffered from decisions to exploit shale gas, as mentioned above. Air and water quality has been affected by pollution, with spills and accidents occurring, leading to the devastation of land, rivers and streams. Groundwater, as well as drinking water, has been polluted as a result of faults in shale gas sites.[66]

In contrast, French president Francois Hollande has confirmed a ban on shale gas production due to the heavy risk to health and the environment. 74% of France's power comes from nuclear. Friends of the Earth highlight other European examples: Public opposition to fracking is growing in Spain, while in Germany the federal government is reported to be concerned about shale gas extraction. In Holland, fracking is on hold and opposition is strong, and there is a growing anti-fracking movement in Ireland and Sweden. Fracking was banned in Bulgaria in 2012 following widespread protests, and proposals for fracking in Romania and have faced public protests.[67]

There are also moratoriums and/or bans in place in all or parts of Argentina, Australia, Canada New Zealand, Romania, Scotland, South Africa, Switzerland and the Czech Republic. Most notably in the USA where the fracking industry started and the negative effects are 'live,' in the State of Vermont, New Jersey, Pennsylvania, West Virginia, North Carolina, and New York.[68]

While The Chinese government has pledged to reduce coal use, fracking plans as pushing ahead as the country has potentially the largest recoverable shale gas reserves. U.S. fracking consultancy firm, Advanced Resources, has pointed to China's 'abundant shale gas and shale oil potential'.[69]

64 Damian Carrington, Emails reveal UK helped shale gas industry manage fracking opposition, 17 January 2014: http://www.theguardian.com/environment/2014/jan/17/emails-uk-shale-gas-fracking-opposition

65 Caroline Lucas website, The Energy Bill- What it could have looked like, 4 June 2013: http://www.carolinelucas.com/latest/the-energy-bill-what-it-could-have-looked-like

66 Philip J Lightowlers, Chemical pollution from fracking, February 2015: http://www.chemtrust.org.uk/wp-content/uploads/chemtrust-chemical-pollution-from-fracking-june2015.pdf

67 Friends of the Earth Briefing, Unconventional, unnecessary and unwanted, May 2013: http://www.foe.co.uk/sites/default/files/downloads/shale_gas.pdf

68 Keep Tap Water Safe website, Don't Frack The Delaware River Watershed!, 2 June 2015: http://keeptapwatersafe.org/global-bans-on-fracking/

69 John Kemp, U.S. fracking giant goes to China, 11 June 2014: http://uk.reuters.com/article/2014/06/11/china-shalegas-idUKL5N0OS3QF20140611

ALTERNATIVES TO FRACKING

A recent poll shows pro-fracking politicians are hugely out of step with public opinion. The poll of 2,000 UK adults, revealed that 78% would support local renewable energy projects, including wind turbines, that are owned and controlled locally with the profits generated benefitting the community.

Shale gas is the least preferred method of energy generation, with just 2% of public support. More than half (53%) of UK households would support the construction of a wind turbine within two miles of their home. Support for solar is also strong. According to the poll, it's the most popular form of electricity generation among the British public - 30% say it would be their preferred source and almost two thirds (65%) said they would support a solar farm project within two miles of their home.[70]

In 2009 a report from the National Grid found that renewable gas could meet up to 50% of UK residential gas demand. Produced mainly via a process of anaerobic digestion (AD) or thermal gasification of the UK's biodegradable waste, renewable gas represents a readily implementable solution for delivering renewable heat to homes in the UK.

Investment and tax incentives should be directed towards energy saving measures, green gas and other renewables - not fracking.

70 Community Energy Coalition website, Overwhelming support for 'backyard' renewable energy schemes, survey finds, 4 September 2015: http://www.ukcec.org/overwhelming-support-%E2%80%98backyard%E2%80%99-renewable-energy-schemes-survey-finds

CONCLUSION

The Government's backtracking on green policies is reducing our credibility as a nation taking climate change seriously in the run-up to the Paris Climate Change Conference.

Various prominent people are adding their voices to the call for serious action on climate change. Director-General of CBI, John Cridland, has said the UK's green policy reversals send a 'worrying signal'.[71] John Ashton, who was the Special Representative on Climate Change to the Foreign Secretary from 2006 to 2012, speaks about the danger of supporting fracking: 'You can be in favour of fixing the climate. Or you can be in favour of exploiting shale gas. But you can't be in favour of both at the same time.'[72] He also sums up the UK's need to take climate safe policies seriously in the run up to the international talks in Paris: 'our influence has always depended on the credibility of our domestic policies. How can we expect to persuade others if we are not doing ourselves what we ask of them?'[73]

The UK must show a commitment to climate action and show integrity in the lead up to what should be an ambitious agreement in Paris. We must participate in delivering a future without fossil fuels.

Paris should mark a milestone in progress on climate negotiations. The UK should lay its foundations for real climate action in the lead up to, as well as after the talks. Fracking should be off the agenda for the UK.

When it comes to avoiding dangerous climate change, the shift to clean, renewable energy is key. The only safe and responsible thing to do with shale gas is to leave it in the ground.

Caroline Lucas continues to push for a safe climate for all. She says:

'An effective response to climate change requires a complete shift to a carbon-neutral energy system within a generation in all the major economies including Britain. And we know how to do it. We have the technology, we have the engineering capacity and we can afford to do it. All we need is the political will because we cannot do it while making ourselves more, not less dependent on any kind of fossil fuel.'[1]

Widespread fracking in the UK will almost certainly mean that the UK's national emissions targets cannot be reached. Instead, the UK should show climate leadership in Paris and say no to fracking.

Fracking simply doesn't make climate sense.

71 Pilita Clark, UK policy hitting credibility on climate change, says CBI, 22 September 2015: http://www.ft.com/cms/s/0/ff648bd2-6073-11e5-9846-de406ccb37f2.html?ftcamp=published_links%2Frss%2Fin-depth_climate-change%2Ffeed%2F%2Fproduct&utm_source=Daily+Carbon+Briefing&utm_campaign=6c4fb67f52-cb_daily&utm_medium=email&utm_term=0_876aab4fd7-6c4fb67f52-303454717#axzz3mRYOhbVg

72 John Ashton, Briefing for Lancashire County Council, 26 March 2014: http://www.e3g.org/docs/Briefing_for_Lancashire_County_Council.pdf

73 John Ashton, Doha climate talks: diplomacy begins at home, 5 December 2012: http://www.theguardian.com/environment/2012/dec/05/doha-climate-talks-diplomacy

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