

Transition Chesterfield Response to Derbyshire and Derby Minerals Local Plan Summary of key points 18 May 2018

Background Paper on fracking

This paper contains a lot of selective and outdated evidence. There are many more recent and credible references that need to be referenced particularly the comprehensive 2016 Scottish Government Review on unconventional oil and gas and the independent academic review of that process. The paper should also note the many countries that have decided to ban fracking.

Background paper on climate change

This paper does not reflect the serious threat of climate change and should reflect the global scientific consensus that climate-warming trends over the past century are due to human activities. The consequences are likely to be devastating. The paper also needs to clearly state that the main cause of climate change is the burning of fossil fuels and that it has been demonstrated by peer-reviewed studies that to keep within 2C of warming globally, half of gas reserves need to stay in the ground.

Although the paper refers to the current 80% reduction target in the Climate Change Act, it should also reference the fact that the government has committed to a more stringent target reflecting the 2015 Paris Agreement.

Climate Change

Transition Chesterfield welcomes the inclusion of a separate policy on this important issue. The paper should refer to the need to comply with the legally binding CCA and the fact that the UK has signed up to the Paris Climate Agreement 2015. There needs to be an explicit reference to fugitive emissions since these are potentially large in the case of fracking, and may nullify any alleged 'benefits' from the substitution of coal by gas.

Policy SMP3 Climate Change

We suggest the ambiguous policy on climate change is replaced with:

"Climate change impacts should, as far as possible, be avoided and schemes should demonstrate that there is no viable substitute for the mineral/energy and that there is no net increase in greenhouse gas emissions resulting from its extraction and use, taking into account the release of fugitive emissions."

Hydrocarbons: Conventional (Oil and Gas), Unconventional (Shale Gas) and Gas from Coal

There is a strong bias in the paper towards the assumed need for oil and gas, including shale gas. The draft plan states that *"Modern society and the benefits it enjoys are highly dependent on the continued supply of energy, including the continued supply of oil and gas."*

While the NPPF states that *"It is important therefore that there is a sufficient supply of material to provide the infrastructure, buildings, energy and goods that the country needs."* However it does not follow that having sufficient supply of energy means the continued supply of oil and gas. Since 2012 when the NPPF was published there has been massive reductions in the costs of renewables with associated increases in their deployment.

Transition Chesterfield objects to a section of the paper devoted to 'need for oil and gas' and if this is to be included should make very clear that this is a time limited need while society makes the transition to low carbon economy. It should refer to the CCA and the UK's carbon

budgets as well as the need to be mindful of the likely rapid transition from fossil fuels to renewables.

Community benefits

It should be made clear in the paper that the £100,000 for communities is not for the exploratory phase unless fracking takes place, and that this offer of 1% of revenues only 2/3 is directly for the local community, and this offer is subject to review.

Replacing coal with gas

Much of the alleged benefits of shale gas derive from replacing coal fired power stations with gas. However, UK coal power has effectively collapsed, and a rapid reduction in renewables costs means that renewables are much more likely to plug the gap left by coal. By 2035 the government now expects twice as much renewable capacity as it did in 2015 and twice as much battery storage as projected last year. The BEIS 2018 energy projections need to be included in the draft paper and the outdated ministerial statement deleted.

Policy MS17: Proposals for Oil and Gas Exploration and Appraisal

Two alternative options for Policy MS17 are provided in the draft plan. Transition Chesterfield prefers the second option and use of the criteria "*the applicant has demonstrated that all potential adverse environmental, social and economic impacts can be mitigated to levels which are acceptable to the MPA*". This is more comprehensive than the first option which only addresses landscape, historic and biodiversity interests.

In view of the Scottish Government review which identified a range of health impacts, there should also be an explicit reference to mitigation of health impacts.

The draft policy states that operations should be for an agreed temporary period. We suggest that a maximum period of 5 years should be specified.

Transport impacts should be explicitly included, as this is a key issue for many remote and rural sites which can be accessed only by narrow country lanes.

A minimum distance of 500m between well sites and homes should be specified.

Policy MS18: Proposals for Oil and Gas Production and Ancillary Development

In addition to the points above which should also be included in Policy MS18, this policy should require applicants to demonstrate a proven need for the energy and should that its use will result in a reduction in CO₂ emissions (eg by substituting for coal) and taking fugitive emissions into account.

There should also be a requirement to assess the risks of seismic activity, particularly in old mining areas.

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[Transition Chesterfield](#) is a local community group whose aims are to raise awareness of the issues associated with climate change and the need to develop a resilient, sustainable, low-carbon society. We would like to make the following comments on the draft Derbyshire and Derby Minerals Local Plan.

Background Paper on fracking

This paper contains a lot of selective and outdated evidence. There are many more recent and credible references that need to be referenced particularly the comprehensive 2016 Scottish Government Review on unconventional oil and gas¹ and the independent academic review of that process.²

The Scottish Government commissioned a comprehensive review on unconventional oil and gas dedicated specifically to public health as well as reports on climate change, economic impacts, transport, geology, and decommissioning. The evidence collected for the Scottish government enquiry suggests there are significant public health risks and costs from unconventional oil and gas extraction, including fracking. All these reports are relevant to public health, and taken together offer a comprehensive review of existing evidence.

In the interests of balance the paper should also note the countries that have reviewed the evidence on fracking and decided to ban it on the basis of that evidence including Scotland, Ireland, France, Germany, Poland and Bulgaria.

Background paper on climate change

This paper does not reflect the serious threat posed by climate change. For example statements such as "*human activities appear to be increasing the amount of these greenhouse gases in the atmosphere to less stable levels, trapping more heat and causing the global temperature to increase.*" play down the threat by the words "appear" and failing to acknowledge or refer to the many catastrophic consequences of climate change.

Instead the paper should reflect the global scientific consensus that climate-warming trends over the past century are due to human activities and that the consequences are likely to be devastating. Already we are seeing loss of sea ice, accelerated sea level rise and longer, more intense heat waves. The IPCC states that "*Taken as a whole, the range of published evidence indicates that the net damage costs of climate change are likely to be significant and to increase over time.*"³ This sentence would be better rewritten as "*human activities, particularly the burning of fossil fuels, are increasing the amount of these greenhouse gases in the atmosphere to less stable levels, trapping more heat and causing the global temperature to increase with significant and damaging impacts that are likely to increase over time.*"

The background paper also needs to clearly state that the main cause of climate change is the burning of fossil fuels and that it has been demonstrated by peer-reviewed studies that to keep within 2C of warming globally, a third of oil reserves and half of gas reserves and over

¹ <http://www.gov.scot/Topics/Business-Industry/Energy/onshoreoilandgas>

² Watterson, A. and Dinan, W. (2018). Public Health and Unconventional Oil and Gas Extraction Including Fracking: Global Lessons from a Scottish Government Review. *International Journal of Environmental Research and Public Health* 2018, 15, 675; doi:10.3390/ijerph15040675

³ https://www.ipcc.ch/publications_and_data/ar4/wg2/en/tssts-4-7.html

80 per cent of current coal reserves need to stay in the ground.⁴ Although the paper refers to the current 80% reduction target in the Climate Change Act, it should also reference the fact that the government has committed to a more stringent target reflecting the 2015 Paris Agreement.⁵

Climate Change – main section

Transition Chesterfield previously wrote about the need to address climate change in the Minerals Plan and welcome the inclusion of a separate policy on this.

It is essential that the need to comply with the legally binding CCA is explicitly referenced in this section, just as other pieces of legislation are referenced elsewhere in the draft plan, and not just mentioned in the background paper. As in the background paper this section should also make clear that the Government has confirmed that the UK will enshrine in law a long-term goal of reducing its net carbon emissions to zero, as called for in the Paris Agreement.

The Committee on Climate Change have stated that Shale Gas on a commercial scale is incompatible with our carbon budgets unless three tests are met⁶ which the government have yet to demonstrate. The third of these is the need to find additional abatement measures, which consist of Carbon Capture and Storage (CCS), an undeveloped technology, the programme for which was cancelled in November 2015. The Committee say *"Should CCS not be deployed, meeting the 2050 emissions reduction target will require elimination of almost all fossil fuel use in power generation, transport and buildings. This implies a reduction in gas consumption by 2050 of around 80% on today's levels. It also implies that gas would cease to be used for electricity generation by the mid-2030s."*

Para 4.3.12 of the draft plan discusses the potential to reduce harmful emissions. However there needs to be an explicit reference to fugitive emissions since these are potentially large in the case of fracking, and may nullify any 'benefits' from the substitution of coal by gas (as we note later in this response).

Policy SMP3 Climate Change

The draft policy currently states:

"Adverse climate change impacts should, as far as possible, be avoided and schemes resulting in greenhouse gas emissions that are unreasonably high or are disproportionate to the public benefits of the scheme are likely to be refused."

The UK's legally binding carbon targets should not be compromised by the extraction of unnecessary minerals and energy. Inevitably there will be (for the next few years at least) some greenhouse gas emissions associated with the extraction and mining of minerals and energy, which can be mitigated to some extent by the use of on-site renewable energy sources. Some minerals will be used locally for building materials, for which there is currently no viable substitute. However in the case of energy, for example for the generation of electricity, there are many viable and cost effective alternatives.

⁴ <https://www.nature.com/articles/nature14016>

⁵ Hansard (2016) Daily Hansard debate. 14/03/16.

www.publications.parliament.uk/pa/cm201516/cmhansrd/cm160314/debtext/160314-0003.htm

⁶] The need to regulate tightly production emissions; the need for such shale gas production as does happen to substitute for imported gas and not add to overall gas consumption; and the need to find additional abatement measures to compensate for the emissions attached to production, even under tight regulation. Committee on Climate Change (2016) Onshore Petroleum. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/535207/Compatibility_of_onshore_petroleum_with_meeting_UK_carbon_budgets_-_Committee_on_Climate_Change_-_2016.pdf

The proposed policy provides insufficient protection against climate change and is ambiguous, as it is not clear how ‘unreasonably high’ is to be measured and could result in activities with significant and adverse climate impacts. Given the legal and moral imperative of meeting our climate change targets, and given that much of the justification for fracking is on the basis of its supposed climate change benefits, Transition Chesterfield recommends that the policy should instead state:

“Climate change impacts should, as far as possible, be avoided and schemes should demonstrate that there is no viable substitute for the mineral/energy and that there is no net increase in greenhouse gas emissions resulting from its extraction and use, taking into account the release of fugitive emissions.”

Hydrocarbons: Conventional (Oil and Gas), Unconventional (Shale Gas) and Gas from Coal

Inevitably, as this paper draws directly on the NPPF, there is a strong bias towards the assumed need for oil and gas, including shale gas.

Para 8.2.8 quotes para 42 of the NPPF which states that *“Minerals are essential to support sustainable economic growth and our quality of life. It is important therefore that there is a sufficient supply of material to provide the infrastructure, buildings, energy and goods that the country needs.”*

Para 8.2.29 of the draft plan states that *“Modern society and the benefits it enjoys are highly dependent on the continued supply of energy, including the continued supply of oil and gas.”*

While the statement from the NPPF is reasonable in requiring a sufficient supply of energy, it does not follow that this requires or implies the continued supply of oil and gas. Instead a combination of energy efficiency and renewable energy sources can meet UK’s energy needs in a more cost effective and less environmentally damaging way.

Since the NPPF was published in 2012 there have been significant increases in the proportion of energy supplied from renewable sources due to rapidly falling costs. In 2017 wind generated 15% of UK’s entire electricity supply while renewables provided nearly 30%, up from 25% in 2016.⁷ In 2017 the Government cost estimates suggested onshore wind and solar will be as cheap or cheaper than gas in 2020, gaining a clear cost advantage by 2025.⁸ However in late 2017 it was suggested onshore wind is now cheaper than new gas plants and further innovations will mean that cost reductions of renewables will continue.⁹ Developments in grid balancing and storage will mean an increasing role for renewables in the electricity supply in the future.

Most of the gas consumed in the UK is currently for electricity generation (see Fig 1 below). It should also be noted that around 25% of the gas produced in the UK in 2016 was exported.¹⁰

⁷ RenewableUK (2018). Record year for wind energy – Government releases official figures. Press release, 29 March 2018. <http://www.renewableuk.com/news/393182/Record-year-for-wind-energy--Government-releases-official-figures.htm>

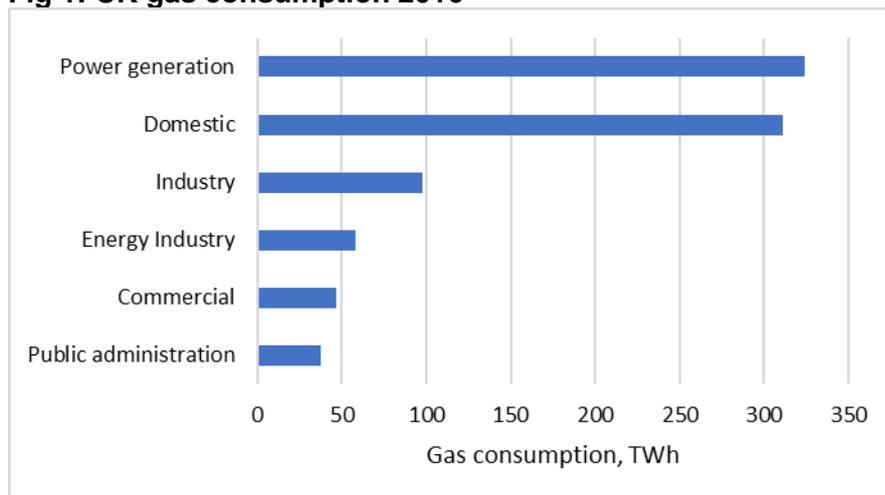
⁸ BEIS (2017) Updated energy and emissions projections. <https://www.gov.uk/government/publications/updated-energy-and-emissions-projections-2017>

⁹ <https://www.carbonbrief.org/analysis-uk-auction-offshore-wind-cheaper-than-new-gas>

¹⁰ DUKES Digest of UK Energy Statistics 2017.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/643414/DUKES_2017.pdf

Fig 1: UK gas consumption 2016¹¹



There is a growing consensus that the essential and inevitable transition from fossil fuels to renewables will be much faster than previously envisaged. It is not just the absolute levels of supply which dictate the transition but the marginal supply.¹² In 2015, solar and wind energy sources supplied only 2% of total energy but 33% of marginal energy supply. It is estimated that a tipping point will occur in around 2020 when non fossil fuel energy sources will make up all marginal energy supply.¹³

Transition Chesterfield objects to a section of the paper devoted to a ‘need for oil and gas’. If this section is to be included it should make very clear that this is a time-limited need while society makes the transition to low carbon economy. It should refer to the CCA and the UK’s carbon budgets as well as the need to be mindful of the likely rapid transition from fossil fuels to renewables. Neither is shale gas a bridge to a low carbon economy, and is more likely to increase rather than reduce greenhouse gas emissions, due to the fugitive emissions of methane.

Fugitive emissions

Para 8.2.10 of the draft plan notes the NPPF statement that “*mineral planning authorities should ensure that the integrity and safety of underground storage facilities are appropriate, taking into account the maintenance of gas pressure, prevention of leakage of gas and the avoidance of pollution.*”

It is essential that the policy addresses fugitive emissions (ie leakage) of methane gas. While methane emits about half the carbon dioxide of coal when it’s burned, leading some to tout it as a relatively “clean” fuel, methane is 28-36 times more powerful over a 100 year period.¹⁴ Therefore if fugitive emissions of methane are too high, it nullifies any advantage in reducing greenhouse gas emissions. It is estimated that around 3% of natural gas during distribution in the US is lost and unaccounted for.¹⁵ Given the higher global warming

¹¹ As above

¹²Oxford Smith School of Enterprise and the Environment (2017) Revolution not evolution: Marginal change and the transformation of the fossil fuel industry. Discussion Paper Feb 2017 <http://www.divestinvest.org/wp-content/uploads/2017/09/OxfordUniversity.Revolution-not-evolution-SFP-Discussion-Paper-February-2017.pdf>

¹³ ibid

¹⁴ Over a 20 year period the GWP of methane is even higher, 84-87 times more powerful than CO2 due to its shorter lifetime in the atmosphere (it’s impacts are discounted over the longer 100 year span). <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>

¹⁵ <https://www.scientificamerican.com/article/how-much-natural-gas-leaks/>

potential of methane, leakage levels above 3% over a 100 year period, would effectively cancel out any emission advantage over coal.

A much-quoted Government study states that *“With the right safeguards in place, the net effect on UK GHG emissions from shale gas production in the UK will be relatively small.”*¹⁶ However it has been shown that this conclusion is based on selective use of “bottom-up inventory studies” which significantly under-estimate the impact of shale gas production by an estimated factor of four compared to more recent top-down studies.¹⁷

Estimates of gas production leakage rates are expressed as a percentage of total production and various peer-reviewed studies show that they range from 0.6 to nine per cent. One study which uses a probability approach estimated that fugitive emissions from unconventional gas extraction (such as fracking) were likely to be higher than from conventional gas extraction due to the greater probability of fractures in well casings.¹⁸

National Energy Policy

Para 8.2.17 quotes the 2009 National Policy Statement for Energy and 2011 Overarching National Policy Statement for Energy which address the long term challenge of meeting security of supply while acknowledging the implications of climate change. It is assumed that indigenous supplies of coal, oil and gas will play a continuing role in meeting national energy requirements. However both of these documents are outdated.

Para 8.2.12 notes that the National Planning Practice Guidance March 2014 suggests that *“there is a pressing need to establish through exploratory drilling, whether or not there are sufficient recoverable quantities of unconventional resources such as shale gas and coal bed methane present to facilitate economically viable full scale production.”* Para 8.2.19 quotes a British Geological Survey study highlighting extent of potential reserves¹⁹ and that the government considered shale gas had potential to ‘contribute significantly’ to the UK’s energy security. However the BGS survey did not estimate how much of the gas was likely to be recoverable.

Expert analysis from Heriot-Watt suggests that the UK’s geology is unlikely to be suitable for hydraulic fracturing.²⁰ Buckling and uplifting of the basins containing the shale resources, coupled with deformation by folds and faults has created pathways that have allowed some of the oil and gas to escape. The inherent geological complexity of the sedimentary basins has not been fully appreciated or articulated. As a result the author, Professor Underhill states *“the opportunity has been overhyped and reserve estimates remain unknown. At the very least, there is a need to factor this considerable and fundamental geological uncertainty into the economic equation. It would be extremely unwise to rely on shale gas to ride to the rescue of the UK’s gas needs only to discover it is 55 million years too late.”*

¹⁶

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/237330/MacKay_Stone_shale_study_report_09092013.pdf

¹⁷ http://www.talkfracking.org/wp-content/uploads/2013/04/20170200-whitehalls_fracking_science_failure-lq.pdf

¹⁸ <http://www.pnas.org/content/early/2014/06/25/1323422111/suppl/DCSupplemental>

¹⁹ BGS central estimate was 1,329 trillion cubic feet (37,600 km³ or 376*10¹¹ cubic metres)

²⁰ Underhill, J (2017). There may be a huge flaw in UK fracking hopes - the geology. Article in The Conversation. 16 August 2017. <https://theconversation.com/there-may-be-a-huge-flaw-in-uk-fracking-hopes-the-geology-80591>

There are also indications that the amount of recoverable quantities of shale gas will be significantly limited by infrastructure constraints.²¹ This 2017 peer-reviewed study suggests the amount of practically recoverable gas from the north of England (Lancashire, Cheshire, Yorkshire, Nottinghamshire and Derbyshire) was many times lower than the BGS estimate, and equivalent to about 3.4 years worth of UK total gas consumption.

Another report estimated that 6,100 wells would be required to replace 50% of UK gas imports over the 2021-2035 period, equivalent to 1.1 wells drilled each day. The author of that report, Professor Calvin Jones from Cardiff University has stated “*On current trends there is no evidence that fracked gas can be brought to market a sufficiently low cost, and sufficiently great volume to make any significant profit, or to make any difference to the UK energy security position.*”²²

In March 2018 the government disclosed that an earlier estimate of 155 UK shale gas wells by 2025 is now considered to be out of date and there are no new figures.²³ Based on a 2016 Cabinet Office report, the estimate was far less ambitious than that developed by the Institute of Directors of 4,000 wells by 2032. This also confirms that, even within the space of a year, the government has downgraded its expectations of shale gas recovery. This needs to be reflected in the draft paper, together with the academic studies cited above, to give balance to the over-optimistic and outdated predictions that shale gas has the potential to ‘contribute significantly’ to the UK’s energy security.

Community benefits

Para 8.2..20 of the draft plan refers to the community benefits that would accrue to local communities where shale gas extraction took place. It states very misleadingly that

“The benefits would include £100,000 for each community situated near each exploratory well and 1% of the revenue from every production site.”

This is part of the fracking companies Charter.²⁴ However the Charter actually states:

- Provide benefits to local communities at the exploration/appraisal stage of £100,000 per well site where hydraulic fracturing takes place;
- Provide a share of proceeds at production stage of 1% of revenues, allocated approximately 2/3rd to the local community and 1/3rd at the county level;

Government also notes that “*This Charter and offer to communities will be regularly reviewed as the industry develops and operators consult with communities.*”²⁵

It should be made clear in the paper that the £100,000 for communities is not for the exploratory phase unless fracking takes place, and that this offer of 1% of revenues only 2/3 is directly for the local community, and this offer is subject to review.

Replacing coal with gas

Paras 8.2.22 – 8.2.25 discuss the Energy Act 2013. Para 8.2.23 refers to a 2015 Written Ministerial Statement which sets out Government thinking. This states “*one of the greatest*

²¹ Clancy S. A. et al (2017) An assessment of the footprint and carrying capacity of oil and gas well sites: The implications for limiting hydrocarbon reserves. Sci Total Environ. doi: 10.1016/j.scitotenv.2017.02.160

²² Jones, C. (2018) The Implications of Fracking in UK Gas Import Substitution https://cdn.friendsoftheearth.uk/sites/default/files/downloads/FOE-Frack-Import-Report_0.pdf

²³ <https://drillordrop.com/2018/03/01/estimates-of-uk-shale-gas-wells-out-of-date-says-minister/>

²⁴ <http://www.ukoog.org.uk/images/ukoog/pdfs/communityengagementcharterversion6K.pdf>

²⁵ <https://www.gov.uk/government/publications/about-shale-gas-and-hydraulic-fracturing-fracking/developing-shale-oil-and-gas-in-the-uk#community-and-public-engagement>

and most effective contributions we can make to emissions from electricity generation is by replacing coal-fired power stations with gas.”

Yet UK coal power has effectively collapsed with three coal-fired power plants shut in 2016, and most are expected to halt operations by 2022. In 2016 coal contributed only 9% of electricity generation.

As discussed earlier due to a rapid reduction in costs renewable energy sources are much more likely to plug the gap left by coal. In January 2018 the government slashed its outlook for new gas plants and predicted renewables overtaking gas by 2020 to become the UK's number one source of electricity generation.²⁶ The government projections include less than half as much new gas capacity by 2035 as expected last year and a quarter of the 2015 figure. In contrast, by 2035 BEIS now expects twice as much renewable capacity as it did in 2015 and twice as much battery storage as projected last year.

The BEIS 2018 energy projections²⁷ need to be included in the draft paper and the Written Ministerial Statement removed.

The proposed approach

Para 8.2.45 states that the NPPF reflects the need to provide for a steady and adequate supply of hydrocarbons. This is incorrect and nowhere does the NPPF state this. As explained earlier the NPPF requires the need for a “*sufficient supply of material to provide the infrastructure, buildings, energy and goods that the country needs*” and it is a second level inference that this implies the need for oil and gas. Given the rapid technological change in UK's energy mix it is important that this Plan, which will be in place for many years, does not make the mistake of ‘picking winners’ and instead sticks with the stated approach in the NPPF to provide a sufficient supply of energy, without stating what that energy source should be.

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Two alternative options for Policy MS17 are provided in the draft plan.

We prefer the second option and use of the criteria “*the applicant has demonstrated that all potential adverse environmental, social and economic impacts can be mitigated to levels which are acceptable to the MPA*”. This is more comprehensive than the first option which only addresses landscape, historic and biodiversity interests.

In view of the Scottish Government review which identified a range of health impacts, there should also be an explicit reference to mitigation of health impacts.

The draft policy states that operations should be for an agreed temporary period. We suggest that a maximum period of 5 years should be specified.

Transport impacts should be explicitly included, as this is a key issue for many remote and rural sites which can be accessed only by narrow country lanes.

A minimum distance of 500m between well sites and homes should be specified.

²⁶ <https://www.carbonbrief.org/analysis-uk-government-slashes-outlook-for-new-gas-power-plants>

²⁷ The projections include less than half as much new gas capacity by 2035 as expected last year and a quarter of the 2015 figure. In contrast, by 2035 BEIS now expects twice as much renewable capacity as it did in 2015 and twice as much battery storage as projected last year.

Policy MS18: Proposals for Oil and Gas Production and Ancillary Development

In addition to the points above which should also be included in Policy MS18, this policy should require applicants to demonstrate a proven need for the energy and that its use will result in a reduction in CO₂ emissions (eg by substituting for coal) and taking fugitive emissions into account.

There should also be a requirement to assess the risks of seismic activity, particularly in old mining areas. A former President of the Geological Society of London has said that fracking near geological faults in former coal mining areas could trigger earthquakes and should not take place without careful assessment of all available geological data.²⁸ He has stated that fracking should not be carried out within 850m of a fault in any area but in mining areas the risk could be greater.

²⁸ <https://drillordrop.com/2018/04/26/beware-of-fracking-in-uk-mining-areas-says-earthquake-expert/#more-63442>