CUMBRIA MINERALS AND WASTE LOCAL PLAN

EXAMINATION 30 NOVEMBER 2016

HEARING STATEMENT: FRIENDS OF THE EARTH

Appearances

Naomi Luhde-Thompson and Magnus Gallie, Friends of the Earth England, Wales and Northern Ireland *(who also both wish to be in attendance)*

Appendices to this Statement:

1) Proposed Amendments to Policy DC13
2) Exec Summary: Onshore Petroleum – The Compatibility of UK onshore petroleum with meeting the UK's carbon budgets – March 2016 (published July 2016)
3) Excerpt from Amber Rudd's speech on a new direction for energy policy - Nov 2015:

Summary

(Legal Matter 1b – Other Legal and Procedural Requirements

- Whether the plan meets all other relevant legislative requirements.)

***Matter* 6 –** Development Management Policies

- *Whether the Development Management Policies strike the right balance between encouraging sustainable winning and working of minerals and protecting sensitive receptors.*

1. Policy DC13 has in our view failed to address greenhouse gas emissions and climate change as per section 19(1A) of the Planning and Compulsory Purchase Act 2004.

Matter 6:

We understand that the Inspector wishes to consider the application of Section 19 (1A) under soundness in relation to this particular policy (i.e. DC13).

2. Section 39(2) of the Planning and Compulsory Purchase Act 2004 makes it a statutory duty to act with the objective of achieving sustainable development:

"The person or body must exercise the function with the objective of contributing to the achievement of sustainable development."

3. In terms of national policy, sustainable development is defined in the context of United Nations and UK Government principles:

"International and national bodies have set out broad principles of sustainable development. Resolution 42/187 of the United Nations General Assembly defined sustainable development as meeting the needs of the present without compromising the ability of future generations to meet their own needs. The UK Sustainable Development Strategy Securing the Future set out five 'guiding principles' of sustainable development: living within the planet's environmental limits; ensuring a strong, healthy and just society; achieving a sustainable economy; promoting good governance; and using sound science responsibly"[1]

4. In addition, the NPPF provides 12 core planning principles in relation to sustainable development, stating - among other objectives - that planning should: *"support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change, encourage the re-use of existing resources…and encourage the use of renewable energy resources (for example by the development of renewable energy)*[2]. Paragraph 151 of the same document then states that Local Plans must be prepared with the objective of contributing to the achievement of sustainable development. Policies of the Cumbria Minerals Local Plan are therefore required to be *consistent* with this approach in the NPPF of delivering sustainable development, as per the tests of soundness.

5. Paragraph 7 of the NPPF more clearly defines the environmental objectives of sustainable development, stating the need to *"mitigate and adapt to climate change including moving to a low carbon economy"*. In addition, paragraph 93 states that planning *"plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions"*. Paragraph 94 elaborates on this: *"Local planning authorities should adopt proactive strategies to mitigate and adapt to climate change16, taking full account of flood risk, coastal change and water supply and demand considerations."* Footnote 16 directs the local planning authority to ensure

[1] Pg 2 – NPPF – 2012: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf
[2] Para 17, point 5 – NPPF 2012 (as above)

that their 'proactive strategies' are *"In line with the objectives and provisions of the Climate Change Act 2008"*.

6. Section 1(1) of the Climate Change Act 2008 provides a duty of the Secretary of State to ensure that the net UK carbon account for the year 2050 is at least 80% lower than the 1990 baseline[3]. Amendments to planning law, to account for the 2008 Climate Change Act include Section 19(1A) of the Planning and Compulsory Purchase Act 2004 (as implemented by section 182 of the 2008 Planning Act) which states that:

> *"Development plan documents must (taken as a whole) include policies designed to secure that the development and use of land in the local planning authority's area contribute to the mitigation of, and adaptation to, climate change."*

7. This puts a statutory duty on plan making authorities to contribute to the mitigation of and adaptation to climate change and is a more resilient legislative requirement than those of paragraphs 93 and 94 of the NPPF. Indeed, Planning Practice Guidance also notes that legislation requires action by local planning authorities[4]. A reasonable interpretation of this duty would be that carbon emissions should be reduced overall. The reference point and mechanism to enable this being the Carbon Budgets set out by the Government in response to the Climate Change Act 2008.

8. While the planning authority's thinking may be that the policies set out for fossil fuel minerals (hydrocarbons) are independent of such national carbon reduction frameworks e.g. in relation to power generation, the reality is that Cumbria's plan should be aligned with these budgetary provisions and targets.

9. The UK Government has acknowledged the risk presented to the carbon budget by onshore petroleum got through onshore activity through Section 49 of the Infrastructure Act 2015. In this provision, the Committee on Climate Change (CCC) must advise on the likely impact of

[3] In order to achieve this, *the Committee on Climate Change has recommended a 60% cut by 2030, with average emissions in the power sector falling to 50gCO2e/kWh by that date.* In May 2011 the Government accepted the Committee's recommendation for the level of the 4th budget - a limit of 1950 $MtCO_2e$ over the years 2023-2027, amounting to an emissions cut of 50% on 1990. The Government has accepted that the aim should be to deliver this through domestic action, though the use of credits has not been ruled out.

[4] Para 002 National Planning Practice Guidance statement on Climate Change (CD48.2)

"*combustion of, and fugitive emissions from, petroleum got through onshore activity*" on the Secretary of State's ability to meet the duties imposed by the Climate Change Act 2008 to not exceed the carbon budget. It follows that if the UK Government accepts the reasonableness of assessing the impact of the combustion and fugitive emissions from onshore petroleum in relation to meeting the carbon budget, then Cumbria must also be able to assess the impact of these activities.

10. In addition, Government received the Committee on Climate Change's report in March (published in July 2016)[5] that concluded that the exploitation of shale gas would not be compatible with UK carbon budgets, or the 2050 commitment to reduce emissions by at least 80% unless three crucial tests[6] are met, including i) emissions must be strictly limited during shale gas development; ii) overall gas consumption must remain in line with UK carbon budgets and that iii) emissions from shale gas production must be accommodated within UK carbon budgets (a stance reiterated within the Paris Agreement the UK is now signed up to). An underlying requirement of the three tests also includes an assumption that Carbon Capture Storage (CCS) would currently be operating, a programme which is currently in abeyance. Despite the Department for Energy and Climate Change (DECC) rebuttal to the CCC's report in July 2016, which suggested the 3rd of the CCCs tests can be met, this was made without reference to the Paris Agreement's objectives to limit climate change by 1.5 Degrees Celsius. Put simply, the development of a UK shale gas industry cannot be reconciled with the UK's commitments made in the absence of CCS, as well as the auspices of the Paris Agreement.

11. In light of such evidence, Cumbria Council should now consider how it can reflect both the limits set by the carbon budgets nationally, and how it can make a cumulative and ongoing assessment of the decisions made under the framework of its plan for a period to 2030 (this only being 20 years away from the 2050 target: where overall emissions will have to have been reduced by 80% against the 1990 baseline.). In addition, the Government's approach to power

[5] Onshore Petroleum – The Compatibility of UK onshore petroleum with meeting the UK's carbon budgets – March 2016 (published July 2016)

[6] **The three CCC tests:**

i) 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.

ii) 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.

iii) 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.

generation, which is linked to the need for *production* of hydrocarbon minerals, is that if it is to meet its carbon budgets, it has to achieve a 100g CO2 per kwH by 2030. Gas fired power stations are around 300-400g CO2 KwH. We therefore suggest, as PPG[7] and the CCC have advised, that the policy needs to distinguish between exploration, appraisal and production activities, and to clearly reference the need for a 'safe and sustainable' policy approach as referred to in the Written Ministerial Statement[8].

12. While strategic policy SP12[9] (Climate Change mitigation and Adaptation) suggests some adherence to the requirements of the Climate Change Act 2008 (re carbon reduction) in terms of design, neither it nor Policy DC13 provide any specific points with regards to consideration of greenhouse gas emissions for the extraction of energy minerals. Para 13.33 mentions council support for energy from waste schemes that make a positive contribution to reducing GHG emissions, but no such support is mentioned for schemes entailing energy mineral extraction. This is an inconsistent approach.

13. The issue of greenhouse gas emissions has been considered within the context of other minerals plan examinations, which has led to the incorporation of new policy text that is linked to climate change mitigation. Para 93 of the NPPF - as previously mentioned - states that *"planning plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions"*. While SP12 mentioned above makes reference to carbon reductions in the context of design factors for minerals developments, we are of the view that more explicit linkage is needed covering the extraction of unconventional gas and GHG emissions.

14. In addition, the case of Lancashire County Council, arguments made in light of the need to consider climate change mitigation led to the inclusion of such a reference within Development Management Policy DM2 (Development Management) *[10]*. This states that:

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[7] Planning Practice Guidance - Paragraph: 107 Reference ID: 27-107-20140306

[8] Para 1 – WMS - Shale gas and oil: https://www.gov.uk/government/publications/shale-gas-and-oil-policy-statement-by-decc-and-dclg/shale-gas-and-oil-policy-statement-by-decc-and-dclg

[9] "*Proposals for minerals and waste management developments should demonstrate that:*

- *proportionate to the scale and type of development, energy management, carbon reduction and resource efficiency have been determining design factors for the development; and…"*

[10] Joint Lancashire Minerals and Waste Local Plan – Site Allocations and Development Management Policies Pt 1 (September 2013) http://www.lancashire.gov.uk/media/228119/Local-Plan-Part-One-website-1-.pdf

"…developments will be supported for minerals or waste developments where it can be demonstrated to the satisfaction of the mineral and waste planning authority, by the provision of appropriate information, that all material, social, economic or environmental impacts that would cause demonstrable harm can be eliminated or reduced to acceptable levels. In assessing proposals account will be taken of the proposal's setting, baseline environmental conditions and neighbouring land uses, together with the extent to which impacts can be controlled in accordance with current best practice and recognised standards.[11]

In accordance with Policy CS5 and CS9 of the Core Strategy developments will be supported for minerals or waste developments where it can be demonstrated to the satisfaction of the mineral and waste planning authority, by the provision of appropriate information, that the proposals will, where appropriate, make a positive contribution to the:

- *Local and wider economy*
- *Historic environment*
- *Biodiversity, geodiversity and landscape character*
- *Residential amenity of those living nearby*
- ***[Reduction of carbon emissions]*** (our emphasis)
- *Reduction in the length and number of journeys made…*[12]

15. With such policy precedents set elsewhere, it would seem inconsistent for there to be reference to climate change mitigation within strategic policy SP12 (Climate Change mitigation and adaptation), for energy from waste schemes[13]; but with no such reference for energy minerals. We therefore maintain that the plan is not sound in light of its failure to incorporate climate change mitigation with relation to policies for minerals, explicitly within Policy DC13, as it required by the Planning and Compulsory Purchase Act 2004.

[11] Joint Lancashire Minerals and Waste Local Plan – Site Allocations and Development Management Policies Pt 1 (September 2013) http://www.lancashire.gov.uk/media/228119/Local-Plan-Part-One-website-1-.pdf

[12] Pg 10 –Lancashire Minerals Plan - Site Allocation and Development Management Policies - Part One – 2013

[13] Para 13.33

Policy DC13 as Drafted

16. Policy DC13 of the submission version of the Cumbria MWLP anticipates that proposals for the exploration, appraisal and production of shale gas will be permitted where it will not have any unacceptable environmental impact. No reference is made to possible impact on climate change, one of the principal concerns surrounding fracking.

17. In addition, consideration of the possible impacts of coal gasification are limited, especially for such an unproven technology. With regards to coal production, the current policy is limited in terms of recognised government policies which aim to phase out this technology by 2025.

18. Our proposed changes are given at Appendix 1.

The Revised Policy

19. FoE's proposed planning policy does not amount to a ban or moratorium on fracking or coal production: rather it requires a positive contribution to the reduction of carbon emissions. As well as this, we have aimed to ensure that the policy takes into account very real risks to the environment and to human health to ensure that these risks are effectively eliminated.

20 As well as requesting more robust information on underground coal gasification schemes than the policy currently provides for, our approach to coal extraction within the policy remit is to require a phasing out of this extraction process by 2025 within the plan area at the latest. This is in line with requirements within the NPPF[14] which states that permission for the extraction of coal should not be given unless the proposal is "environmentally acceptable". In expectation of the 5th carbon budget, Amber Rudd also announced in late 2015 the Government's intention to consult on the closure of all unabated coal power stations by 2025, and restrict its use by 2023.[15] (See also Appendix 3). This provides a clear long term policy steer in terms of the intensions for coal extraction and burning within the forthcoming years. It is with this national planning policy and national energy policy direction in mind that the basis of our changes to the coal section of policy DC 13 have been made and are considered justified.

[14] Para 149: NPPF - 2012

[15] Amber Rudd's speech on a new direction for energy policy - Nov 2015: https://www.gov.uk/government/speeches/amber-rudds-speech-on-a-new-direction-for-uk-energy-policy

Appendix 1

Proposed Changes to Policy DC13 (Criteria for Energy Minerals)

Proposals for energy minerals developments that conform to the Strategic and other Policies of this Local Plan will be considered subject to the following criteria:

Exploration and Appraisal

Planning permission will be ~~granted~~ ***considered*** for proposals for exploration and appraisal of oil and gas resources provided that:

a. the site and equipment is sited a location where it can be demonstrated that it will only have an acceptable environmental impact, including on communities' ***health, safety and amenity;*** and

b. the proposal provides for appropriate baseline monitoring prior to commencement of development; ~~and~~

c. the timely restoration and subsequent aftercare of the site, whether or not oil or gas is found;

d. the risk of adverse environmental impacts has been assessed and mitigated; and

e. where greenhouse gas emissions associated directly and indirectly with the site are reduced.

Commercial production

Planning permission will be ~~granted~~ ***considered*** for proposals for commercial production of oil and gas, provided that:

a. a full appraisal programme for the oil or gas field has been completed;

b. the proposed location is the most suitable, taking into account environmental, geological, and technical factors, ***the avoidance of protected areas, groundwater protection zones, sensitive water bodies and air quality management areas; and the impact on communities' health, safety and amenity is acceptable;***

c. the cumulative impacts of the development of the gas field and essential associated infrastructure have been assessed; ~~and~~

d. provision is made for mitigation or compensation for ~~significantly~~ adverse impacts on the environment and communities; ***and***

e. the risk of adverse environmental impacts has been assessed and mitigated; and

f. the proposal is compatible with enabling the UK to meet its carbon budgets and the 2050 target (reduction in emissions in 2050 by at least 80% on 1990 levels).

Combined planning applications for more than one phase will only be considered if all relevant information, including environmental information, to support the full extent of the application is provided.

Underground Coal Gasification

~~The criteria set out above in this policy, for exploration and appraisal and commercial production, will also apply to proposals for onshore surface works or ancillary development to support offshore Underground Coal Gasification (UCG).~~

~~Where a UCG proposal follows a planning permission for coal extraction only, a separate planning application will be required for development related to UCG.~~

Underground coal gasification is unproven technology and any proposal must demonstrate by appropriate evidence and assessment that reasonable doubt can be excluded as to adverse impacts of the proposed development alone or in combination with other developments.

Coal

Planning applications for coal extraction will only be considered where;

- the proposal is environmentally acceptable; or
- can be made so by planning conditions or obligations; or, if not
- provides national, local or community benefits which clearly outweigh the likely impacts to justify the grant of planning permission
- ***it has been demonstrated that any risk of adverse impacts has been eliminated; and***
- ***the proposal is compatible with the phase out of coal in power generation by 2025***

For underground coal mining, potential impacts to be considered and mitigated for will include subsidence and the disposal of colliery spoil. Provision of sustainable transport will be encouraged, as will Coal Mine Methane capture and utilisation.

Appendix 2

Executive Summary: Onshore Petroleum – The Compatibility of UK onshore petroleum with meeting the UK's carbon budgets – March 2016 (published July 2016) (pgs. 7-11)

The Committee has a duty under the Infrastructure Act (2015) to advise the Government on the compatibility of exploiting domestic onshore petroleum, including shale gas, with UK carbon budgets and the 2050 emissions reduction target under the Climate Change Act (2008). This report provides our first advice under the Infrastructure Act. In this advice, the Committee focuses primarily on shale gas, as this has larger potential implications for emissions than other sources of onshore petroleum (e.g. shale oil).

It is outside the scope of the Committee's legal remit to investigate other issues that have been raised in relation to the development of shale gas, such as local noise, traffic, water and wider environmental impacts. The Committee's advice relates solely to greenhouse gas emissions and the impact on carbon budgets. There are other issues linked to ongoing gas consumption and carbon budgets but not specific to shale gas production, which we will consider separately in future reports including our annual Progress Reports to Parliament.

The implications for greenhouse gas emissions of shale gas exploitation are subject to considerable uncertainties, both regarding the size of any future industry and the emissions footprint of production. This uncertainty alone calls for close monitoring of developments. The Committee will report back earlier than its next statutory deadline five years from now should this be necessary.

The UK regulatory regime has the potential to be world-leading but this is not yet assured. The current regime includes important roles for the Health and Safety Executive and the relevant environmental regulators (e.g. the Environment Agency in England), which will need to be managed seamlessly. Onshore petroleum exploitation at scale would have unique characteristics in the UK. This may ultimately necessitate the establishment of a dedicated regulatory body. It certainly requires that a strong regulatory framework is put in place now.

Our assessment is that exploiting shale gas by fracking on a significant scale is not compatible with UK climate targets unless three tests are met:

•**Test 1: Well development, production and decommissioning emissions must be strictly limited.** Emissions must be tightly regulated and closely monitored in order to ensure rapid action to address leaks.- A range of technologies and techniques to limit methane emissions should be required, including 'reduced emissions completions' (also known as 'green completions') and liquid unloading mitigation technologies (e.g. plunger lift systems) should these be needed;

- A monitoring regime that catches potentially significant methane leaks early is essential in order to limit the impact of 'super-emitters';

Production should not be allowed in areas where it would entail significant CO_2emissions resulting from the change in land use (e.g. areas with deep peat soils);

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

•**Test 2: Consumption – gas consumption must remain in line with carbon budgets requirements.** UK unabated fossil energy consumption must be reduced over time within levels we have previously advised to be consistent with the carbon budgets. This means that UK shale gas production must displace imported gas rather than increasing domestic consumption.

•**Test 3: Accommodating shale gas production emissions within carbon budgets.** Additional production emissions from shale gas wells will need to be offset through reductions elsewhere in the UK economy, such that overall effort to reduce emissions is sufficient to meet carbon budgets.

There are also potential implications of UK shale production for global emissions. There are two issues:

- **Lifecycle emissions of tightly regulated domestic shale gas as against imports.** The overall emissions footprint of UK shale gas, if tightly regulated, is likely to be broadly similar to that of imported gas. Tightly regulated domestic production may provide a small emissions saving when displacing imports of liquefied natural gas.

- **Impact on the global energy system.** Increased UK production of fossil fuels could affect global emissions, depending on the extent to which this displaces coal, displaces low-carbon energy or leads to increased fossil fuel consumption.

There has been insufficient time to assess the second of these fully. We plan to publish analysis and views of this issue in the summer of 2016 alongside our advice to the Scottish Government on Unconventional Oil and Gas.

Test 1: Well development, production and decommissioning emissions must be strictly limited

Left entirely unregulated, the emissions footprint of shale gas production could be substantial. Any significant level of exploitation of UK resources in this way would be inconsistent with carbon budgets. However, the current proposals from Government and regulatory bodies include action to regulate emissions and there are technologies and techniques that are known to limit greenhouse gas emissions from shale gas production. Experience and data from the US provide estimates of the costs and effectiveness of many of these measures.

The UK regulatory regime has the potential to be world-leading but this is not yet assured. Some technologies and techniques are likely to be required by the Environment Agency as a condition of the production licence. However, the precise nature of these standards needs to be clarified and must meet the tests set out above, before production could begin. These standards should apply not just to the well pad but to all associated infrastructure prior to the gas being injected into the grid or put to use.

US experience also indicates that an important contributor to methane emissions has been so-called 'super-emitters': large methane leaks left unchecked for extended periods of time. As a consequence, a small number of wells have been found to contribute disproportionately to emissions. Limiting emissions therefore requires that the monitoring regime catches the super-emitters quickly and significantly limits the quantity of methane released to the atmosphere, alongside the technologies to limit known sources of emissions.

The minimum set of techniques and technologies required to limit emissions can do so at a cost comparable to the cost of reducing emissions elsewhere in the economy, consistent with the requirements of carbon budgets. As evidence improves, it is likely to be cost-effective and necessary to require the inclusion of further emissions reduction measures.

Test 2: Consumption – gas consumption must remain in line with carbon budgets requirements

Carbon budgets and the 2050 target can be met in a range of ways, which imply different balances of reductions in coal, oil and natural gas use, as well as the application of carbon capture and storage (CCS). But, in general, they require unabated consumption (i.e. without CCS) of all fossil fuels to decline over time, most likely reducing the use of fuels with the highest carbon intensity (e.g. coal) earlier and more strongly than those with lower carbon intensity (e.g. natural gas).

The UK currently gets around half its gas supplies from imports, mainly via pipeline from Norway and via liquefied natural gas (LNG) tankers. Domestic output is projected to continue its decline over the coming decades and most projections suggest that the share of imports may rise over time, even as consumption falls.

There may be benefits for energy security and domestic industry if new domestic sources of natural gas production reduce UK dependence on imported gas. There is no case, however, for higher levels of UK gas consumption than we have previously set out.
The long-term path for UK gas consumption, assuming carbon budgets are met, depends strongly on whether or not carbon capture and storage (CCS) is deployed (Figure 1):

•**CCS widely deployed**. Use with CCS would provide a way to consume fossil fuels in a low-carbon way. It could also mean that some residual use of unabated fossil fuels in hard-to-decarbonise applications (e.g. some heavy vehicles or gas boilers) can be accommodated even in 2050. This is likely to imply a reduction in gas consumption by 2050 of around 50%relative to today's levels.

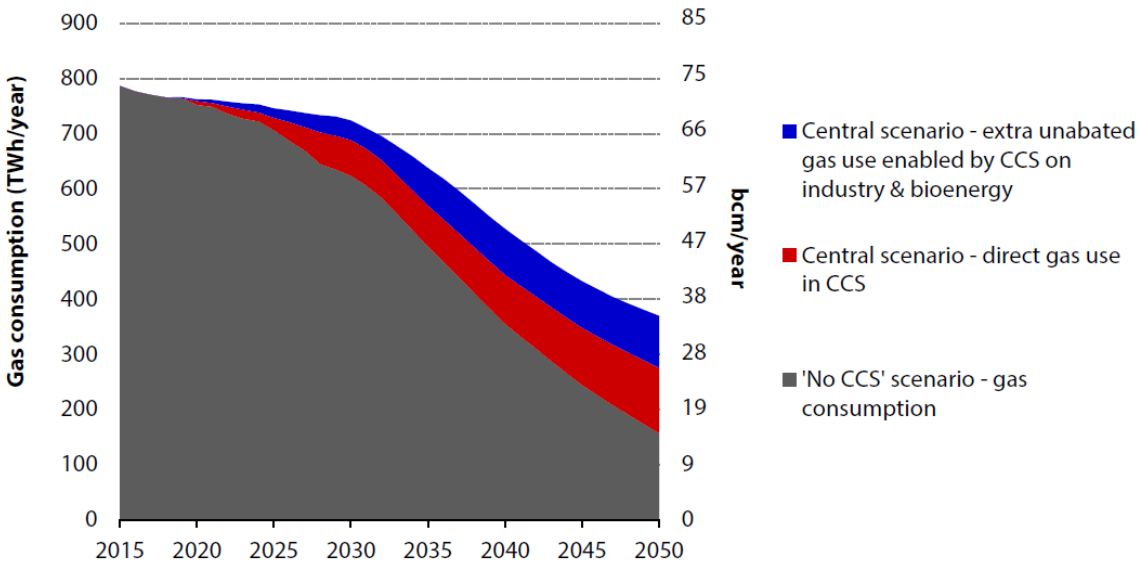
•**No CCS**. Should CCS not be deployed, meeting the 2050 emissions reduction target will require elimination of almost all fossil fuel use in power generation, transport and buildings. This implies a reduction in gas consumption by 2050 of around 80% on today's levels. It also implies that gas would cease to be used for electricity generation by the mid-2030s.

As well as providing a smaller market for fossil fuels, the greater pressure placed on UK emissions targets in the absence of CCS would also make it more difficult to accommodate the emissions associated with production, as there would be less scope to reduce emissions elsewhere in the economy in order to compensate.

A UK approach to delivery of carbon capture and storage (CCS) is urgently needed.

Unabated gas consumption must be consistent with the levels in the scenarios presented in our advice on the fifth carbon budget, unless reductions in emissions beyond any the Committee has identified can be found elsewhere. Therefore, any new sources of UK production must be used to displace imports. Allowing unabated consumption above these levels would not be consistent with the decarbonisation required under the Climate Change Act.

Figure 1: Direct and indirect impacts of CCS availability on gas consumption to 2050



Source: CCC analysis, based on scenarios in the fifth carbon budget advice.
Notes: The 'No CCS' scenario entails each sector following its Max scenario, excluding CCS measures, in order to meet the overall 2050 target.

Test 3: Accommodating shale gas production emissions within carbon budgets

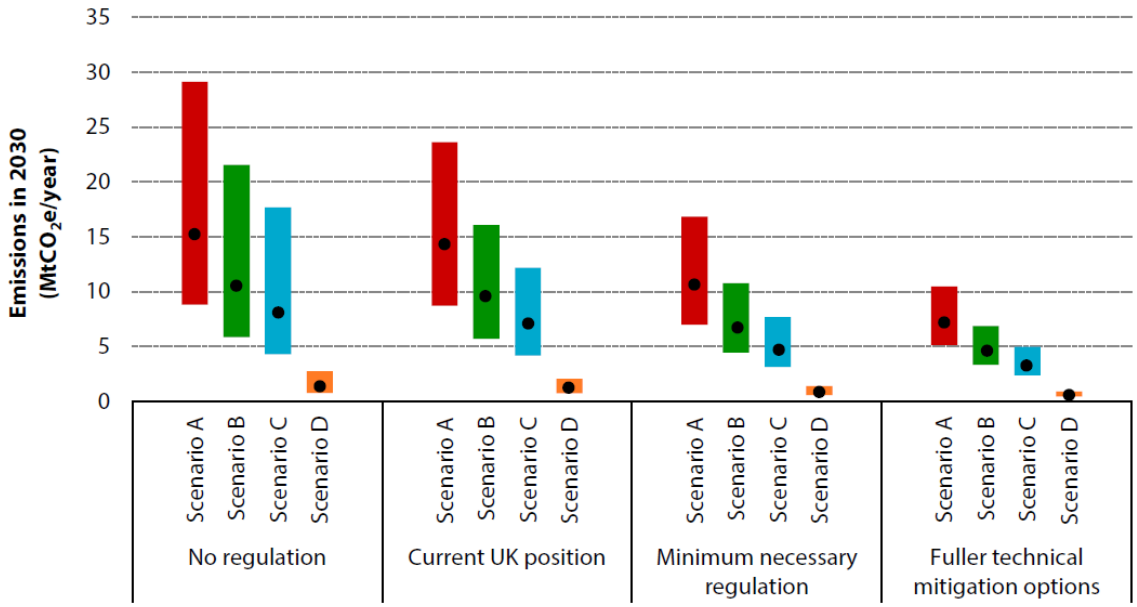
Domestic production of shale gas will lead to some additional UK emissions, even if gas consumption is not affected and emissions relating to production are strictly limited through tight regulation and monitoring. The size of these extra emissions depends on the size of the future industry, about which there is considerable uncertainty.

Should the industry grow very quickly, the impact on overall UK emissions from UK production could be around 11 $MtCO_2e$/year in 2030 under a tight regulatory regime. This is similar in magnitude to the emissions savings in the agriculture sector under our central fifth carbon budget scenario. If regulation were more lax, emissions would be significantly higher (Figure 2). In this advice, we compare methane and CO_2 emissions using the 100-year Global Warming Potential (GWP_{100}) of 25. This metric is used as standard in international and UK emissions accounting, including carbon budgets and the 2050 target. We note however that the GWP_{100} does not directly measure the effect of emissions on end-of-century global temperature, which is how international climate limits are framed (i.e. targets to hold the increase in global temperature to well below 2°C and pursue efforts to limit to 1.5°C). The relative effect of today's

methane emissions on temperature in 2100 will be less than the GWP_{100} implies, while those later in the century, closer to the point of peak temperature, will have a more significant effect. Our analysis for the fifth carbon budget showed that there is uncertainty over the level of non-traded emissions in 2030 of around 23 $MtCO_2e$/year in both directions, and flexibility to increase the amount of emissions saving totalling around 26 Mt/year.

Given this, accommodating additional emissions from shale gas production of 11 Mt/year may be possible, although it would require significant and potentially difficult offsetting effort elsewhere. This should be considered in the report that the Climate Change Act requires the Government to deliver by the end of 2016 setting out its plans to meet the fourth and fifth carbon budgets.

Figure 2: Impact of UK shale gas production on UK greenhouse gas emissions (2030)



Source: CCC analysis.
Notes: Scenarios A to D refer to the shale gas production scenarios presented in Chapter 2.

Appendix 3

Excerpt from Amber Rudd's speech on a new direction for energy policy - Nov 2015:

https://www.gov.uk/government/speeches/amber-rudds-speech-on-a-new-direction-for-uk-energy-policy

"Coal

To set an example to the rest of the world, the UK also has to focus on where we can get the biggest carbon cuts, swiftly and cheaply.

That is hard to do when, after 20 years of action on climate change, 30% of our electricity still comes from unabated coal.

One of the greatest and most cost-effective contributions we can make to emission reductions in electricity is by replacing coal fired power stations with gas.

For centuries coal has played a central role in our energy system.

But it's the most carbon intensive fossil fuel and damages air quality.

Gas produces half the carbon emissions of coal when used for power generation.

Unabated coal is simply not sustainable in the longer term.

In an ideal world, the carbon price provided by the ETS would phase out coal for us using market signals. But it's not there yet.

So I want to take action now.

I am pleased to announce that we will be launching a consultation in the spring on when to close all unabated coal-fired power stations.

Our consultation will set out proposals to close coal by 2025 - and restrict its use from 2023.

If we take this step, we will be one of the first developed countries to deliver on a commitment to take coal off the system.

But let me be clear, we'll only proceed if we're confident that the shift to new gas can be achieved within these timescales."