The Fifth Carbon Budget - Call for Evidence

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Question and Response form

When responding please provide answers that are as specific and evidence-based as possible, providing data and references to the extent possible. Please limit your response to a maximum of 400 words per question.

Questions for consideration:

A. Climate Science and International Circumstances

Climate science and international circumstances are important criteria in setting carbon budgets.

- The science indicates the impacts associated with different levels of climate change and the limit on emissions globally if these risks are to be contained.
- International circumstances inform the prospects of future action to reduce emissions globally, potential requirements of the UK to contribute to those actions, and prospects for low-carbon technology development and carbon pricing.
- The EU places obligations on Member States to reduce emissions to contribute to reductions in the bloc as a whole. These imply a minimum level of effort for the UK's carbon budgets.

The Committee intends to draw primarily on the work of the IPCC, as published in the Fifth Assessment Report, in assessing the implications of climate science for the budget advice

The Committee's advice is based on a climate objective to limit central estimates of temperature rise to as close to 2°C as possible, with a very low chance of exceeding 4°C by 2100 (henceforth referred to as "the climate objective"). This is broadly similar to the UNFCCC climate objective, and that of the EU.

In order to achieve this objective, global emissions would have to peak around 2020, before decreasing to roughly half of recent levels by 2050 and falling further thereafter.

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The UNFCCC is working toward a global deal consistent with such reductions. Individual parties are submitting pledges for effort beyond 2020, with the details of the agreement to be discussed in Paris late in 2015.

The EU has agreed a package that requires a reduction in emissions of at least 40% on 1990 levels by 2030, on the way to an 80-95% reduction by 2050. The UK Government supported this package, while arguing for an increase to 50% in the context of a global deal.

The US and China have jointly made pledges for the period beyond 2020. The US has pledged a reduction of 26-28% by 2025 versus 2005, requiring a doubling of the rate of carbon reduction compared to 2005-2020 and on a trajectory to economy-wide cuts of the order of 80% by 2050. China has pledged to peak CO_2 emissions around 2030, and to make best efforts to do so earlier.

Question 1 The IPCC's Fifth Assessment Report will form the basis of the Committee's assessment of climate risks and global emissions pathways consistent with climate objectives. What further evidence should the Committee consider in this area?

The CCC should consider in particular evidence from the CBI and other progressive UK business groups that want Britain to lead by example in managing, mitigating and adapting to climate change.

The impact of a changing and increasingly volatile climate on production (not only agricultural) could possibly compromise the UK's ability to meet its 5th C budget and beyond. Has the Committee examined the sensitivity of its budgets to future climate impacts, e.g. peer-reviewed modelling work?

Question 2 ***To what extent are the UN talks in Paris likely to have implications for the Committee's advice beyond the pledges and positions announced in advance of the talks?***

Signing a comprehensive climate agreement in Paris is only the first step in developing a global consensus on action, but it is likely to set in train an international race for 'first mover' advantages in decarbonising many sectors of production, including agriculture. The CCC may need to further develop its expertise in specific sectors – for example, by appointing an agricultural production

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and/or agricultural engineering specialist to the Committee or CCC staff.

Question 3 ***Based on the available evidence, does the EU 2030 package reflect the best path to its stated 2050 ambition? How might this package change, specifically its targeted emissions reduction, either before the end of Paris or after Paris?***

The EU has been too cautious in not repeating the success and clear messages of its earlier 2020 Climate and Energy Package. Although the GHG target is firm, the subsidiary 2030 goals are unambitious and non-binding on Member States, which risks losing the EU's earlier lead among global trading blocs in setting the agenda. However this may have limited impact if other major players take the initiative. There is also a risk that some of the hardest decisions are delayed until close to mid-century.

Question 4 ***How does the UK's legislated 2050 target affect its ability to support international efforts to reduce emissions, including its position in negotiations? Does the level of UK carbon budgets have any additional impact (over-and-above the 2050 target) for the UK in international discussions?***

The UK 2050 target has been laudable in setting the appropriate tone for many national commitments on decarbonisation. However, it is important for the UK's carbon budgets to reflect practicable but stretching interim goals for 2030 and 2040, as long as UK production sectors are incentivised to lead without being placed at an unreasonable competitive disadvantage. It is disappointing therefore that UK officials lobbied for a weaker EU commitment on renewable energy for 2030.

B. The cost-effective path to the 2050 target

The carbon budgets need to set a path that is achievable from today without being over-optimistic about what is achievable in later periods to prepare for the 2050 target.

The Committee has previously set out scenarios for 2030 that balance effort before 2030 with potential opportunities from 2030 to 2050. The scenarios aim to include ways of reducing emissions that are likely to be relatively low cost and actions that will develop options that may need to be deployed at scale by 2050.

These scenarios, reviewed in detail in the Committee's report *The Fourth Carbon Budget Review – the cost-effective path to the 2050 target*, include substantial investment in low-carbon power generation, roll-out of low-carbon heat (heat pumps and district heating), development of the markets for ultra-low emissions vehicles and a combination of energy efficiency measures and fuel switching in industrial sectors.

The scenarios also reflect detailed assessments of what is practically deliverable, and the Committee monitors progress towards them as part of its statutory duties. The *2014 Progress Report to Parliament* indicated that current policy would not be enough to meet the fourth carbon budget, but that the 'policy gap' could be closed at affordable cost.

The set of policy options required to close the gap include:

- Strengthening the EU Emissions Trading System.
- Setting a clear objective for Electricity Market Reform (EMR) beyond 2020.
- Focusing on low-cost residential energy efficiency.
- Simplifying policies targeting commercial energy efficiency.
- Tackling financial and non-financial barriers to low-carbon heat.
- Pushing for strong EU targets for new vehicle efficiency in 2030.

The Government has subsequently published various documents, including its formal response, as required under the Climate Change Act, and the National Infrastructure Plan. The Plan includes investments of around £100 billion in low-carbon power generation in the 2020s, in line with the scenarios from the EMR Delivery Plan that reach 100 gCO_2/kWh by 2030. It also has significant investments in offshore oil and gas and in the road network. This includes £15 billion of new spending on roads and around £50 billion on offshore oil and gas.

Question 5 ***In the area(s) of your expertise, what are the opportunities and challenges in reducing emissions to 2032, and at what cost? What may be required by 2032 to prepare for the 2050 target, recognising that this may require that emissions in some areas are reduced close to zero?***

Continued policy and regulatory support for land-based renewables will enable agriculture to remain profitable and more resilient to climate change. Accelerated introduction of new technologies and investment in farm infrastructure for agricultural production will be needed. We understand the CCC is currently re-assessing its MACCs framework for agriculture. The agricultural sector may merit a consideration of more futuristic ideas that presently have no cost basis. In addition, the MACC curves do not capture the wider environmental and social implications of climate change mitigation in addition to the interactions and potential trade-offs between specific measures.

The Greenhouse Gas Action Plan (GHGAP) workshop on future mitigation potential identified a range of possible measures to deliver GHG reduction in the 2020s and beyond. It was felt that a consortium of researchers should be funded to take the work forward to assess the potential for mitigation and implementation. Additional mitigation measures beyond 2030 were fewer in number with generally less certainty about their applicability or mitigation potential. The range of stakeholders present also asked questions about the robustness of the link between farm profitability and existing greenhouse gas mitigation options. It is clear that there is enormous variability in emissions intensity that varies with context.

The workshop also identified a number of gaps in research and knowledge which are fundamental to current and future mitigation measures. Elsewhere the CCC has identified avoiding nitrogen excess and use of more nitrogen-efficient pasture and crop plants as abatement options for the 4th carbon budget. Yet the workshop recognised that there is a need to better understand the basics of agricultural practices (e.g. the use of innovative fertiliser technologies *etc*.) to maximise nutrient use efficiency. It was also highlighted that there is much debate about how to reliably "measure" improved nitrogen-use efficiency in crops/pasture because of the complex nature of this genetic trait.

An economic assessment of GHG mitigation policy options for EU Agriculture by the JRC considers a range of policy options to reduce emissions from EU agriculture by up to 28% by 2030. The report highlights that mandatory targets reduce herd size, yield and crop acreage (for fodder) with the beef sector hit hardest. In addition the EU's trade balance is projected to worsen for almost all products. However increases in productivity make up some of the difference between supply and demand. The report's conclusions include the statement that "the more flexible the mitigation policy instruments are implemented, the less are the production effects on an aggregated EU level and hence also any potential emissions leakage effects".

Difficult decisions on solutions already available like first generation biofuels need to be based on sound evidence rather flawed perception. To quote a recent IEA Bioenergy workshop in Brussels In October 2014 "food-versus-fuel reports that initiated the work on sustainability and iLUC in particular, which were not scientifically robust, should no longer be part of the general discourse."

The government and the CCC should re-consider the basis of their carbon pricing

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estimates for the cost-effectiveness of measures to 2030.

Question 6 ***What, if any, is the role of consumer, individual or household behaviour in delivering emissions reductions between now and 2032? And, separately, after 2032?***

UK production (and not consumption) of agricultural goods and services is the key focus for emissions reduction in our sector. However, we recognise the possible future role e.g. in the 2030s, of UK consumer behaviour in shaping EU and world demand trends for agricultural products.

It is not clear to us how influencing consumer/individual behaviour can be delivered ethically and equitably and without the risk of exporting emissions/production.

Question 7 ***Is there evidence to suggest that actions to further reduce emissions after 2032 are likely to be more or less challenging to achieve than actions in the period up to 2032?***

Scientific evidence amassed so far by the NFU and other signatories of the GHGAP indicates that there is most probably an ultimate limit to GHG reductions from agriculture, bearing in mind the physical and biological constraints of what will remain a predominantly outdoor production process as well as consumer concerns about the shape of the countryside. Like many sectors, agriculture may face a steeper trajectory of GHG emissions reduction after 2032 rather than before that date. As stated elsewhere in this response, additional mitigation measures beyond 2030 put forward at the GHGAP workshop were fewer in number with generally less certainty about their applicability or mitigation potential.

Climatic impacts post 2032 may also limit mitigation potential. The workshop felt that there was limited understanding of the mitigation potential for agriculture under the range of potential future climates.

Question 8 ***Are there alternatives for closing the 'policy gap' to the fourth carbon budget that could be more effective? What evidence supports that?***

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More credit should be given for agriculture's potential to decarbonise the rest of the economy through land-based renewables. Both of the likely lowest-cost renewables in the next decade (onshore wind and solar) are being deployed extensively in the agricultural sector.

Question 9 ***Are the investments envisaged in the National Infrastructure Plan consistent with meeting legislated carbon budgets and following the cost-effective path to the 2050 target? Would they have wider implications for global emissions and the UK's position in international climate negotiations?***

n/a

C. Budgets and action

The UK's statutory 2050 target requires actions across the economy to reduce emissions. Many of these actions will be driven by (UK and devolved) Government policy and implemented by businesses and consumers. There will be an important role for Local Authorities in successful delivery.

Although the carbon budgets do not require specific actions, they provide an important indication of the overall direction that policy will take in future. Once set, carbon budgets can only be changed if there has been a significant change in the relevant circumstances set out in the Climate Change Act.

Feedback from businesses as part of the Committee's 2013 Call for Evidence for the review of the fourth carbon budget was that stability is an important and valuable characteristic of carbon budgets.

Question 10 ***As a business, as a Local Authority, or as a consumer, how do carbon budgets affect your planning and decision-making?***

The NFU has played a leading role, nationally and internationally, in the agricultural sector response to the challenges presented by climate change. Meeting future carbon budgets is part of the business environment in which our sector now operates.

Question 11 ***What challenges and opportunities do carbon budgets bring, including in relation to your ability to compete internationally? What evidence do you have for this from your experience of carbon budgets to date?***

To date, much of the agricultural initiative on meeting carbon budgets has been based upon improvements in business resource efficiency. This ought to give our members' businesses a comparative advantage against their EU and global competitors on top of any advantage based on natural resource (maintaining strategic capacity e.g. in dairy, beef and sheep). However, the basis for estimating UK agricultural GHG emissions is still subject to revision, so it remains difficult to assess our progress in meeting previous carbon budgets.

Question 12 ***What would you consider to be important characteristics of an effective carbon budget? What is the evidence for their importance?***

There needs to be a balance between goals set for various production sectors and their technical ability to meet these goals without leakage (exporting emissions to other countries).

More realistic carbon price based upon the current level and recent trajectory in the ETS.

D. Other issues

The Climate Change Act requires that in designing the fifth carbon budget we consider impacts on competitiveness, fiscal circumstances, fuel poverty and security of energy supply, as well as differences in circumstances between UK nations. High-level conclusions on these from our advice on the fourth carbon budget were:

- **Competitiveness** risks for energy-intensive industries over the period to 2020 can be addressed under policies already announced by the Government. Incremental impacts of the fourth carbon budget are limited and manageable.
- **Fiscal impacts**. The order of magnitude of any fiscal impacts through the 2020s is likely to be small, and with adjusted VED banding and full auctioning of EU ETS allowances could be neutral or broadly positive.

- **Fuel poverty**. Energy policies are likely to have broadly neutral impacts on fuel poverty to 2020, with the impact of increases in electricity prices due to investment in low-carbon generation being offset by energy efficiency improvement delivered under the Energy Company Obligation. Incremental impacts through the 2020s are likely to be limited and manageable through a combination of further energy efficiency improvement, and possible income transfers or social tariffs.

- **Security of supply** risks due to increasing levels of intermittent power generation through the 2020s can be managed through a range of flexibility options including demand-side response, increased interconnection and flexible generation. Decarbonisation of the economy will reduce the reliance on fossil fuels through the 2020s and thus help mitigate any geopolitical risks of fuel supply interruption and price volatility.

- **Devolved administrations**. Significant abatement opportunities exist at the national level across all of the key options (i.e. renewable electricity, energy efficiency, low-carbon heat, more carbon-efficient vehicles, agriculture and land use).

Question 13 ***What evidence should the Committee draw on in assessing the (incremental) impacts of the fifth carbon budget on competitiveness, the fiscal balance, fuel poverty and security of supply?***

Question 14 ***What new evidence exists on differences in circumstances between England, Wales, Scotland and Northern Ireland that should be reflected in the Committee's advice on the fifth carbon budget?***
n/a

Question 15 ***Is there anything else not covered in your answers to previous***

questions that you would like to add?
Improvements in nutrient efficiency will see multiple environmental benefits i.e. reducing nitrate and phosphorus losses to water and ammonia emissions to the air in addition to reducing GHG emissions from agriculture which will be important to reduce agriculture’s environmental footprint and meet the requirements of EU Directives (e.g. Water Framework and National Emissions Ceiling Directives). We are aware of a number of opportunities to reduce GHGs from the UK’s food and drink supply that require a co-ordinated and integrated approach across the entire supply chain. Examples include reducing food waste, understanding supply chain specifications, better carcase utilisation and changing manufacturing processes. The GHGAP has been working in collaboration with WRAP’s Product Sustainability Forum on some of these options but this area requires further consideration.

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