

Review of the Fourth 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

The Committee's advice assumes 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 in the next few years, before decreasing to roughly half of recent levels by 2050 and falling further thereafter.

The UNFCCC is working toward a global deal consistent with such reductions, to be agreed by 2015. Earlier attempts (e.g. at Copenhagen in 2009, before the fourth budget was recommended or legislated) have failed to achieve a comprehensive global deal to limit emissions.

It is difficult to imagine a global deal which allows developed countries to have emissions per capita in 2050 which are significantly above a sustainable global average, implying the need for emissions reductions in the UK of at least 80% from 1990 levels by 2050.

The EU has not yet agreed a package beyond 2020, but the European Commission is consulting on a range of issues relating to development of climate and energy targets for 2030. In its 2011 Roadmap for moving to a competitive low-carbon economy, the Commission suggested a reduction in emissions of 40% on 1990 levels by 2030, as being on the cost-effective path to an 80-95% reduction by 2050. The UK Government has signalled its support for a 40% reduction by 2030, and for an increase to 50% in the context of a global deal.

China has made ambitious commitments to 2020 which would, if delivered, cut carbon-intensity relative to GDP by around 45%.

The United States could achieve its Copenhagen Accord commitment to reduce emissions by 17% on 2005 levels without the need for further federal legislation.

Question 1: Does the scientific evidence justifying the climate objective remain the same as in 2010? In particular, is there new evidence on climate change impacts?

ANSWER:

Question 2 Have the emissions pathways consistent with achieving this objective changed? In particular, is there new evidence on climate sensitivity to emissions?

ANSWER:

Question 3 Does the climate objective remain in play given international developments? Has the likelihood of getting global agreement changed significantly since the budget was set, and if so why?

ANSWER:

Question 4 How have the prospects for a new EU package for 2030 changed since the Committee's advice and the setting of the budget? What implications do the latest expectations have for the fourth carbon budget?

ANSWER:

Depressed economic conditions in the EU should not be used as an excuse for reduced action. Both the US and China appear to be taking unilateral action and therefore this is precisely the time that the EU should seek more multilateral

cooperation.

Question 5 *What flexibilities are appropriate to reflect possible future changes in EU and international circumstances?*

ANSWER:

B. Technology and economics

In recommending the level of the fourth carbon budget, the Committee developed scenarios which embodied cost-effective emissions reductions to meet the 2050 target.

These scenarios, set out in detail in the Committee's report *The Fourth Carbon Budget – Reducing emissions through the 2020s*, 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.

They were based on official emissions projections together with an assessment of the cost and feasibility of abatement options. Since 2010, official emissions projections have been significantly reduced in the industry and waste sectors, meaning that meeting the legislated 4th carbon budget would require less effort than originally envisaged.

Question 6 *Is there any new evidence to suggest that the type of scenarios upon which the budget was based are no longer feasible or cost effective?*

ANSWER:

Question 7 *In particular, does the possibility of shale gas in the UK change the*

economics of the fourth carbon budget?

ANSWER:

Increased use of gas may change the requirements of the fourth carbon budget. One issue with using LNG is Methane leakage across the supply chain and particularly Methane Slip, where some of the fuel escapes the combustion process and is emitted in the exhaust. This is a major concern, both because Methane has x24 the GHG equivalent of CO₂ and because of the wastage of fuel. It is a problem that is likely to grow as the market for large NG Engines grows. However it can be combated via catalytic oxidation in the exhaust gas and regulation may be needed in this area.

Regarding the use of CNG on HDD vehicles, the Euro VI regulations, which become effective from the end of this year, set exhaust emissions levels for total HC rather than non-methane HC. Greater use of methane as a fuel will probably cause higher levels of methane emissions due to leakage during transportation and storage.

Question 8 Should the budget be tightened to reflect headroom due to significantly lower emissions projections (e.g. due to slower than expected economic growth) since 2010?

ANSWER:

C. Other issues

As required by the Climate Change Act, in designing the fourth carbon budget we considered impacts on competitiveness, fiscal circumstances, fuel poverty and security of energy supply, as well as differences in circumstances between UK nations. Previous high-level conclusions on these 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 9 *Is there any new evidence to suggest that (incremental) impacts of the fourth carbon budget on competitiveness, the fiscal balance, fuel poverty and security of supply have become unmanageable?*

ANSWER:

Question 10 *Is there any new evidence on differences in circumstances between England, Wales, Scotland and Northern Ireland that suggest the need to change the budget?*

ANSWER:

Question 11 *Is there anything else not covered in your answers to previous questions that you would like to add?*

ANSWER:

Black Carbon

The effects of Particulate Matter on health and air quality are well documented, but there is a large and growing body of evidence confirming that black carbon, emitted from diesel engines, is a significant contributor to global warming. Black carbon is estimated to be responsible for around 40% of total warming, with emissions from diesel vehicles comprising nearly a quarter of this.

Fitting of diesel particulate filters (DPFs) to heavy duty vehicles (HDVs) – trucks, buses and construction equipment - is considered the most appropriate action to take to reduce black carbon emissions. By retrofitting DPFs to the legacy fleet, particularly city buses and other vehicles and machines operating in city centres, black carbon emissions from those vehicles will be virtually eliminated. Using a Euro III double deck bus as an example, we estimate that the black carbon savings from fitting a DPF could be 30% of the total climate impact, equivalent to a 44% improvement in fuel consumption. Removal of black carbon at source has an immediate beneficial impact on climate change, as it stays in the atmosphere for days or weeks rather than years as CO₂ does.

The UK Government has signed up to the Climate and Clean Air Coalition <http://www.unep.org/ccac/>, and implementing a national framework of low emission zones with a minimum Euro IV particulate emissions standard for HDVs would demonstrate its commitment to reducing short-lived climate pollutants.