

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.

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 CO₂ 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?

ANSWER:

The IPCC's Fifth assessment report provides the interpretation of the latest climate science for the earth's climate system. The CCC must consider that, at present, the UK's carbon budgets are defined by a legal/political boundary. The two are not compatible for a considered assessment of climate change ambition for the UK. The CCC must take into account the growing body of evidence that the UK is offshoring its environmental responsibility as the UK GHG emissions continue to grow for goods that are consumed by the UK. The legislative development of the 5th Carbon Budget fits well with the start of the new UK Government which provides an opportunity for policies to be developed which can address both production and consumption emissions at the macro level.

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?

ANSWER:

The CCC should not confuse declared 'intentions' with commitments to impose legally binding targets. For Energy Intensive Industries (EIs) in particular, a competitive level playing field will only occur when all competitors inside and outside of the UK/EU are subject to a globally equalised carbon price. It is only at this point that any international agreement will have implications for CCC advice. Until such time that there is a clear and implemented commitment of all competing nations to adopt equivalent reductions there should not be an increase in ambition for the 5th Carbon Budget that places additional burden on manufacturing industry. Moreover, any increased ambition in the 5th Carbon budget should be met by the power generation sector (because the cost of this is spread throughout the economy as the generators pass on the cost of abatement).

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?*

ANSWER:

The Climate Change Act commits the UK to an 80% emissions reduction by 2050 and the EU has a similar ambition but too date the burden of CO₂ reduction has been placed on the traded sector via the EU ETS. This imbalance cannot continue.

With its Roadmap for moving to a competitive low-carbon economy in 2050, the European Commission has looked beyond the short-term carbon budgets and set out a pathway for achieving much deeper emission cuts by the middle of the century. The EU Roadmap suggests that, by 2050, the EU should cut its emissions to 80% below 1990 levels through domestic reductions alone. It sets out milestones with reductions of the order of 40% by 2030 and 60% by 2040. It is important to note that the UK's commitment is more demanding (by 10 percentage points and three years earlier) where the UK has already committed to a 50% reduction by 2027 from its 1990 base year.

The ambitions are already very challenging, especially in the absence of similar commitments internationally.

The most worrying aspect of the EU targets is that, like the UK Carbon Budgets, the targets can be met through exporting our emissions responsibility. Consumption emissions are rising as identified in the CCC's own report Reducing the UK's carbon footprint and managing competitiveness risks (April 2013). This must not continue and should be reversed. EU member states including the UK must take greater responsibility for the emissions of goods they consume. The first step in taking full responsibility for our impact on the atmosphere is to provide a requirement in the Climate Change Act to estimate annually the consumption/footprint emissions of the UK and compare this to the emissions from the UK and its territories.

MPA members compete in global markets. The UK cement and lime sectors already face a significant and growing comparative disadvantage in energy prices, especially electricity prices, which are being driven up by unilateral UK/EU climate policies, as the CCC have recognised. It is likely that the 5th Carbon Budget may result in additional increases in the cost of UK energy supplies. The UK must recognise that it will be necessary for the government to retain and indeed expand the EII compensation package in the absence of meaningful global action on emissions for carbon leakage to be avoided. On

this topic the CCC have been optimistic where in the April 2013 report the CCC analysis suggests that policies already announced by the Government should be sufficient to address the competitiveness risks for energy-intensive industries to 2020. There are two significant problems with this conclusion which demonstrate that it is wrong; 1) the Government has not fully delivered on its promises to Energy Intensive Industries where to date only 53 companies are receiving compensation against the EU ETS and CPS carbon costs. 2) the package is time limited and is not sufficient to address the competitiveness issues over the same period as the carbon budgets.

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?

ANSWER:

The UK is not taking full responsibility for its emissions footprint so the UK is in a weak negotiating position. Reducing the UK's carbon footprint and managing competitiveness risks (April 2013) indicated that consumption emissions are nearly double the emissions accounted for in the carbon budgets. The UK cannot be taken seriously in international discussions until it properly accounts for its environmental responsibility. As recommended by the 2013 Environmental Audit Committee report the UK must modify the Climate Change Act to require the additional accounting of consumption emissions embedded in imports.

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 gCO₂/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?*

ANSWER:

The principle challenge is to decarbonise the UK's footprint whilst expanding

the local production of UK goods and without exporting our manufacturing industry jobs along with our environmental responsibility.

Many economists and politicians have agreed that the cost of decarbonisation action is said to be more cost effective than the cost of inaction. However, the time frame for these kind of claims are often omitted. There is no doubt that in the short to medium term that the cost of UK economy decarbonisation will be high and will most likely outweigh the short term benefits, which will place UK energy intensive industries at a competitive disadvantage.

UK decarbonisation will rely on the decarbonisation of electricity, industry, heat and transport. MPA does not believe that decarbonisation of electricity generation in the range 100-50 gCO₂/kWh, is cost effectively achievable by 2030. MPA's modelling shows that the energy and climate change policy costs in the electricity price for local cement and lime producers will increase by 59% from 2014 to 2020. Neither cement nor lime production in the UK currently attracts compensation from the EII package for carbon and renewable energy costs. The near term indirect cost influences such as this on the competitiveness of local industries, when added to their direct regulatory costs, are compounding a cumulative burden which is placing imports at a distinct cost advantage.

Work on the 2050 roadmap for the cement sector has highlighted the need for CCS in order to decarbonise an industry where 60% of emissions arise from chemical processes. However, CCS is not yet proven in cement manufacture and the UK Government has not yet made any efforts to assist the sector to investigate the possibilities for CCS. In order to have operational CCS in the cement or lime sector in the 2020's and 2030's the UK should have already started its funding programme, as such the UK is lagging behind other countries such as Norway which have been more progressive with its industrial CCS funding.

Another opportunity identified by the cement sector roadmap was the use cement clinker substitutes. Clinker substitutes rely heavily on supply of Ground Granulated Blast Furnace Slag (GGSB) from iron production and quality Pulverised Fly Ash (PFA) from coal fired power generation. With the expected decarbonisation of power generation and the threats to the domestic iron and steel industry, the long term availability of these materials is highly uncertain. This declining domestic supply could lead to the UK cement and concrete industry being locked into imports of these clinker substitutes. Furthermore the existing economic drivers to replace clinker in factory made cements and cement combinations made at the concrete mixer has already resulted in extensive utilisation of domestic GGGS and PFA. Increased clinker substitution rate in the UK supply chain is therefore limited

and it will not reach the added contribution assumed in the 4th budget report. This must therefore be revised in the 5th carbon budget.

For the 5th carbon budget the CCC must also reconsider the assessment in the 4th budget that the replacement of cement and steel with wood in construction could play a role to 2050 but also earlier to 2030. This is an incredibly over simplistic and short sighted assessment. Cement and concrete will play a critical role in the UK's adaptation to climate change by providing flood defence, drainage, low carbon infrastructure and thermally efficient homes and buildings. The role of wood as a replacement for concrete in most of these applications is totally unrealistic. Furthermore, the construction sector should not have material selection imposed by Government policy.

Finally, the 5th budget provides the opportunity to impart some structurally fundamental low carbon solutions into society's economic fabric. In the domestic sector there is considerable opportunity to gain benefit from the use of thermal mass in buildings. Thermal mass is a term that describes the ability of a material to store heat. To be useful in the built environment, the material must also be able to absorb and release heat at a rate roughly in step with a building's daily heating and cooling cycle. Concrete and masonry products do this well and, being dense materials they can also store a lot of heat. Timber absorbs heat too slowly to offer much effective thermal mass and steel conducts heat too rapidly to be in synchronisation with a building's natural heat flows over the day.

The amount of CO₂ that can be saved from utilising the thermal mass of a building depends on the building type and the way in which its thermal mass is used. In the case of a very heavyweight building, the additional concrete can result in a slightly higher level of embodied¹ CO₂, but the operational savings afforded by the thermal mass will typically offset this in a matter of months rather than years.

For housing, the situation is slightly different: The embodied CO₂ in a typical masonry home is about 4% higher than an equivalent timber frame home. Studies by Arup and the NHBC Foundation both arrived at this figure. The Arup study went on to look at operational impacts and found that the passive benefits of thermal mass during the heating seasons resulted in CO₂ savings that offset the figure of 4% in around 11 years.

Consequently, interventions in the building sector that promote and utilize the benefits of thermal mass to manage heat have the potential to provide long lasting energy efficiency and CO₂ reduction opportunities. Action now could help to realize emission reduction benefits for the 3rd, 4th and 5th Carbon

¹ Carbon dioxide emitted when the materials were manufactured

budgets.

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?*

ANSWER:

Historically UK carbon budgets have concentrated on production emissions. However, with emissions associated with imported goods now making up around half of the UK's carbon footprint, consideration should also be given to consumption emissions, which are equally as relevant as UK emissions for global climate change.

The CCC report on 'Reducing the UK's carbon footprint and managing competitiveness risks' states that the UK's Carbon Footprint has increased over the past two decades. Whilst production emissions have fallen (21% between 1990-2010) emissions embedded in UK imports are estimated to have increased by 40% between 1993 and 2010. So the growth of consumption emissions has more than offset reductions in production emissions. This trend undermines the hard work and investment made by UK operators and even the CCC acknowledges that the UK carbon footprint would have increased more had production emissions not been reduced by fuel switching and energy efficiency by UK operators.

By enshrining in law greenhouse gas (GHG) accounting methods that take account of the whole UK footprint, the UK would show leadership in this internationally important policy area and set the benchmark for similar international developments. Such standards should also consider climate change resilience and protecting against flooding, overheating, fire and storms.

As well as the beneficial use of concrete to reduce energy consumption in buildings (see the answer to question 5), the durability of concrete products removes the need for early replacement, which in turn reduces consumption. Lifecycle analysis is required to fully understand the net impact of this on UK emissions. Long term low carbon choices on the construction material and architecture of buildings are of interest to specifiers and designers but the benefits (in terms of lower heating and cooling bills) are felt by the occupier, so there is a role for building occupiers to demand long term durable low carbon buildings.

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?*

ANSWER:

The cement 2050 roadmap showed that significant reductions in emissions beyond 2030 will require breakthrough technologies such as CCS. This is going to be considerably more difficult and costly to implement compared to other technologies available and being implemented now such as fuel switching to biomass.

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

ANSWER:

To close the 'policy gap' to the 4th carbon budget the Government must provide support to all sectors of the economy to aid decarbonisation. To date, efforts have concentrated on de-risking investments in the power sector. Industry, and in particular industries such as cement and lime, which have a high proportion of process emissions, require a similar level of support. This includes financial support for research, development and deployment of breakthrough technologies as well as protection against the high cost of climate change and energy policies such as EMR.

Emissions reductions will not be achieved if EII's are relocated from the UK/EU. This will not only result in an increase in global emissions due to increased imports but could introduce considerable risk in security of supply of materials such as cement and lime that are invaluable to the low carbon economy.

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?

ANSWER:

Infrastructure investment is largely based on concrete and steel construction as it has a requirement for 120 year minimum life. Concrete with its lower carbon footprint will be essential and is locally and responsibly sourced.

There is no evidence that the UK's unilateral actions have had any implications for the overwhelming bulk of the 98.5% of global emissions that are entirely outside UK control.

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?

ANSWER:

MPA has projected that by 2020 energy and climate change policies will cost the cement sector £140m directly and £55m indirectly (through costs passed on in electricity bills). Many of the policies generating these costs are a result of the carbon budgets and related environmental policy. Together the cumulative burden of these policies is discouraging investment in the UK by the global companies that own the majority of UK cement and lime

manufacturing sites.

The UK must ensure that EII's remain globally competitive. Until global energy and climate change policies converge the UK must stick to its intention to protect energy intensive industries from unequal global costs. The first step is to fully protect cement and lime manufacture by retaining the current criteria for assessing carbon leakage in the EU ETS until there is a globally equalised carbon price. The second step is to address the differential indirect costs incurred by UK cement and lime producers by expanding the list of sectors eligible for both carbon cost and renewable cost compensation in the EII package.

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?*

ANSWER:

In the absence of global action on emissions, the policy actions that arise in order to meet unilateral Carbon Budgets directly undermine the ability of the UK cement and lime sectors to compete in global markets. This is evidenced by increasing imports of cement to the UK despite the carbon price being low. Imports by non GB manufacturers now account for 15% of cement sales. Since 2001 cement imports by companies that do not manufacture cement in the UK have increased from 360kt to 1,590kt in 2014. Over the period of the economic recession (2007 to 2009) domestic production declined by 35.8% whilst independent cement importers grew their market share by 4 percentage points. Import capacity into the UK is increasing and it is now thought that the UK cement import capacity is greater than its production capacity. Under the current carbon budget accounting arrangements this loss of UK production to overseas suppliers is perversely seen as positive as UK emissions are reduced. Such economically short sighted carbon budget accounting should not continue.

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

ANSWER:

An effective carbon budget is one that is integrated into the low carbon economy where emissions reduce whilst the economy grows, but importantly the economic growth must be delivered from a balanced portfolio of wealth generation which includes local UK manufacturing and local UK sourcing of goods. Only when the UK is consuming mainly UK locally produced goods made using the best available techniques of low carbon production can the carbon budgets considered to be effective. The current isolation of carbon budgeting and fiscal budgeting cannot continue.

An effective carbon budget is one that is technically feasible with current technologies and affordable. The carbon budget must ensure that overall global carbon emissions are reduced rather than just displaced out of the UK.

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?*

ANSWER:

The CCC should take into account the findings of ICF's report for BIS on climate policy impacts on international energy prices, and the CCC's own most recent analysis showing a near 100% increase in industrial electricity prices by 2030 as a result of existing climate policies.

The research carried out by ICF on behalf of BIS shows that climate and energy policy costs will be the highest for UK manufacturers compared to competing nations. ICF sector specific analysis shows that the UK cement industry will pay higher policy costs compared to the manufacturers of the same product in the principle competing economies. The ICF and MPA work is supported by other research carried out by KPMG which has shown that the UK ranks third in the Global Green Tax Index and first in the carbon and climate change list of 21 countries that are increasingly using green taxes in place of regulation or incentive schemes.

The CCC's proposals must consider the probable consequences for security and affordability of baseload electricity supplies should budget constraints imply very high deployment of unreliable power generation technologies such as wind and solar PV, which cannot be relied upon to generate when power is most required (in some cases for days at a time) and the consequent need for potentially expensive flexible conventional backup.

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?*

ANSWER:

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

questions that you would like to add?

ANSWER: