

## 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.

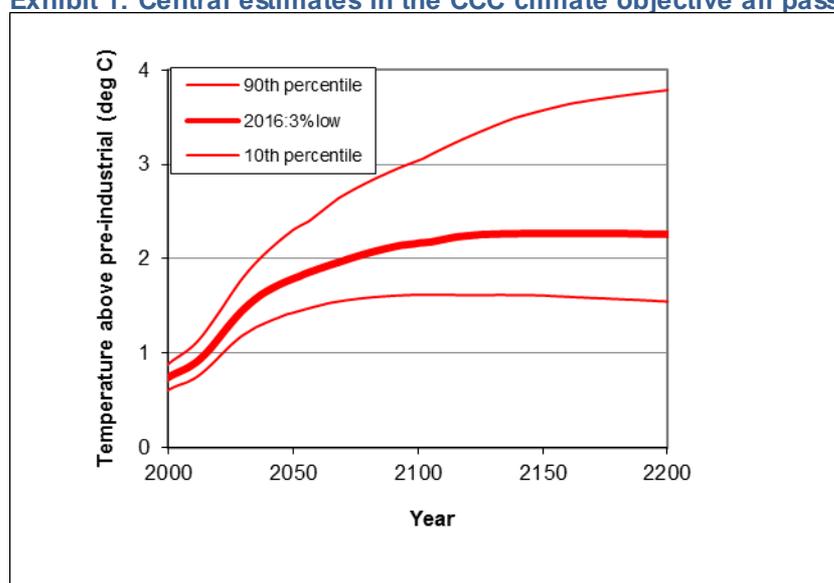
China has made ambitious commitments to 2020 which would, if delivered, cut carbon-intensity relative to GDP by around 45%.

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?**

To the best of our knowledge the scientific evidence about the climate risks associated with 2°C remain essentially the same, awaiting new findings from the IPCC's 5AR. We do, however, respectfully disagree with the Climate Change Committee's *response* to the available science in terms of the risks of passing 2°C it has accepted within its "climate objective". **The CCC seems to embrace global emissions pathways with as little as 37% chance of avoiding 2°C of warming by year 2100.**

**Exhibit 1: Central estimates in the CCC climate objective all pass 2°C**



The Committee appears to have embraced a *range* of preferred global trajectories involving different risks. We summarise these in the table below:

**Table 1: CCC scenarios behind the climate objective<sup>1</sup>**

Trajectory name (Peak year/ Emissions decrease)	Kyoto emissions peak (GtCO <sub>2</sub> e)	Emissions in 2050 (GtCO <sub>2</sub> e)	2050 Kyoto emissions cut from 2007	Cumulative emissions 1990-2050 (GtCO <sub>2</sub> e)	Chance of staying under 2°C by 2100
2016:4%low	56.80	19.61	59%	2423	44%
2016:3%low	56.70	24.14	50%	2536	37%
2014:3%low+	55.93	19.51	59%	2252	49%

Notably, none of these provide even a 50% chance of avoiding 2°C of global warming.

<sup>1</sup> All data from <http://archive.theccc.org.uk/aws3/Ch1%20spreadsheet%20-%20model%20emissions%20and%20climate%20data%20-%20final.xls>

**It is unclear to us why the Committee has adopted a climate objective which involves such a high probability of exceeding 2°C. A global pathway that is “very likely” (>75% chance) or, at the least, “likely” (>66% chance) to avoid 2°C seems to us far more consistent with Britain’s international pledges and also seems a more appropriate reaction to the economic and environmental dangers posed by climate change.**

We respectfully disagree with the Committee that this objective is “broadly similar”<sup>2</sup> with the pledges made by the UK in various international fora to seek to stabilise temperatures beneath the 2°C guardrail, e.g.:

“The Council believes that global average temperatures should not exceed 2 degrees” (European Council 1996)<sup>3</sup>

“We agree that deep cuts in global emissions are required according to science, and as documented by the IPCC Fourth Assessment Report with a view to reduce global emissions so as to hold the increase in global temperature below 2 degrees Celsius, and take action to meet this objective consistent with science and on the basis of equity” (Copenhagen Accord 2009)<sup>4</sup>.

We note that, in its 2012 Emissions Gap report, the UN Environment Programme assumes an emissions budget compatible with a 66% chance of avoiding 2°C. We encourage the CCC to follow their lead in defining the climate objective going forward.

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

Firstly, we note that the global emissions pathways envisaged by the CCC do not seem to have flowed logically from an independent climate objective, but may have significantly informed it. A predetermined decision to hold global emissions reductions to “roughly half of recent levels by 2050”<sup>5</sup> seems to have limited the ambition of the climate objective to its current level (i.e. with a less than even chance of holding global temperature rise below 2°C). As noted in our answer to Question 1, we do not feel that this objective provides sufficient guarantees that we will not pass the 2°C temperature threshold. We advise that, as a minimum, a global emissions pathway consistent with a “likely” (>66%) chance of avoiding 2°C should be pursued.

**Secondly, we emphasise that the national emissions pathway the CCC has prescribed for the UK to meet the Climate Change Act does not seem to allow**

<sup>2</sup> See CCC introduction to this section of the call for evidence

<sup>3</sup> Community Strategy on Climate Change – Council Conclusions Point 6.

<sup>4</sup> <http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf>

<sup>5</sup> See CCC introduction to this section of the call for evidence

**sufficient space for other countries to realistically keep within the global emissions pathways prescribed by the Committee’s “climate objective”.**

The Committee sets the UK emissions pathway on the basis that: “At a minimum the UK contribution to global effort should track the global pathway (e.g. broadly characterised by equal annual percentage reductions from the early 2020s towards 2 tonnes per capita by 2050)”<sup>6</sup> with the added proviso that, “at the country level equal annual percentage reductions to emissions of 2 tCO<sub>2</sub>e per capita in 2050 would vary by country according to their 2020 entry point”<sup>7</sup>. This approach confers the lion’s share of emissions rights to high emitters in developed countries squeezing out poor developing nations. To illustrate: the UK, which currently accounts for 0.9% of global population effectively awards itself around 1.3% of the global emissions space over 1990-2050 under this approach, while Bangladesh which represents 2.2% of current population, would be granted only 0.5% of emissions rights under this system. In other words, the UK gets around 50% more than its population seems to merit, while Bangladesh gets less than a quarter of what it arguably deserves.<sup>8</sup>

At several junctures the Committee has indicated that the current 2050 target and the UK pathway set to meet that target are the *minimum conceivable* under the climate objective.<sup>9</sup> We wholeheartedly agree. The current pathway represent a starting point for UK ambition. A floor which we feel already sits too low. Far from reviewing the 4<sup>th</sup> carbon budget with a view to weakening it, the government should be considering strengthening the budget so that it represents a fairer UK contribution under a global emissions pathway that is commensurate with realistically avoiding 2°C.

Thirdly and lastly, we note that the specific model used by the CCC to determine global budgets, MAGICC 4.11, used climate sensitivity values from the IPCC’s Third Assessment Report. As of September 2008, MAGICC has been updated to reflect values in the IPCC’s fourth report (now MAGICC 5.3v2). The host website for MAGICC notes: “The default and 90% confidence interval values for the climate sensitivity have been updated to 3.0°C (previously 2.6°C) and 1.5-6.0°C (previously 1.5-4.5°C).”<sup>10</sup> The CCC does not appear to have applied this more recent version of MAGICC as part of its 4<sup>th</sup> carbon budget report. If not, that report may have been applying outdated science in determining the global emissions pathways consistent with its own climate objective.

<sup>6</sup> Page 26 [http://archive.theccc.org.uk/aws2/4th%20Budget/CCC-4th-Budget-Book\\_plain\\_singles.pdf](http://archive.theccc.org.uk/aws2/4th%20Budget/CCC-4th-Budget-Book_plain_singles.pdf)

<sup>7</sup> Page 26 [http://archive.theccc.org.uk/aws2/4th%20Budget/CCC-4th-Budget-Book\\_plain\\_singles.pdf](http://archive.theccc.org.uk/aws2/4th%20Budget/CCC-4th-Budget-Book_plain_singles.pdf)

<sup>8</sup> Assumes UK budget of 31.2Gt and a budget for Bangladesh of 10.9Gt against a global emissions budget of 2423Gt (i.e. against the 2016 peak:4% decline MAGICC scenario). International Aviation and Shipping Emissions are included with UK IA&S emissions fixed at 2005 levels out to 2050.

<sup>9</sup> “It is hard to envisage a situation where the UK is less ambitious than the global average, which would require that other countries are more ambitious.” Page 26

[http://archive.theccc.org.uk/aws2/4th%20Budget/CCC-4th-Budget-Book\\_plain\\_singles.pdf](http://archive.theccc.org.uk/aws2/4th%20Budget/CCC-4th-Budget-Book_plain_singles.pdf)

“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.” CCC preamble to this Question

<sup>10</sup> <http://www.cgd.ucar.edu/cas/wigley/magicc/>

While new science is emerging that climate sensitivity might be lower than that published in the 4AR, we argue that the CCC should use 4AR figures until the new consensus is published in the forthcoming 5AR.

**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?***

We do not feel the likelihood of getting some form of international agreement in 2015 has diminished since the government accepted the 4<sup>th</sup> carbon budget in May 17 2011. If anything international climate and energy developments make the prospects more likely, with U.S.A. emissions dropping sharply through the discovery and exploitation of domestic shale gas, and increased regional efforts within the U.S.A., China and other large emitters to reduce emissions through cap-and-trade schemes and other policy instruments.

**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?***

There have been no concrete changes. At the time of writing, the Commission has recently concluded a stakeholder consultation on the 2030 Framework and is expected to respond with a communication or proposal sometime this Autumn. No concrete steps or decisions about the post 2020 climate policy framework are expected before then.

We also note that some form of communication or proposal on the structural reform of the EU ETS is also expected in the Autumn in response to a Commission consultation earlier in the year. At best these will initiate a legislative process, which is unlikely to be complete in the timeframes expressed for the review of the 4<sup>th</sup> budget.

Some have noted that the ETS Directive (2003/87EC) currently specifies an indefinite trajectory for the traded sector cap, declining at 1.74% a year relative to average Phase 2 levels; however, there are several reasons the current trajectory of the ETS cap should not be taken as a realistic indicator of the trajectory of the cap after 2020:

- Firstly the current trajectory was set to align the ETS with the EU 2020 climate target (on the assumption that two thirds of reductions would take place in the traded sector).
- Secondly, the EU ETS trajectory remains conspicuously out of alignment with

Europe's 2050 goal of reducing emissions 80-95% below 1990 levels. According to the European Commission: *"The current linear factor leads to a just over 70% reduction in the ETS cap by 2050, which is not consistent with the EU's agreed long term objective of 80-95% reduction by 2050 compared to 1990"*<sup>11</sup>

It is very likely, then, that the trajectory of the ETS cap after 2020 will be steepened to align it with whatever 2030 target is politically agreed, and/or the 2050 climate milestone.

**The EU's 2030 targets are unlikely to be resolved until the run-up to the UNFCCC COP/MOP in Paris in December 2015, with some conditional elements of that offer unlikely to be resolved until after that conference is concluded. The EU policy context is therefore highly unlikely to be resolved within the timelines scheduled for the review of the 4<sup>th</sup> carbon budget. Even if they were, we note it remains unclear what yardstick would be used to assess the efforts of Europe and other countries against the UK.**

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

Where burden sharing agreements reached at international level oblige the UK to reduce its emissions further than those required under budgets set by the CCC, then the international burden agreements should take precedent and the domestic budgets should be tightened accordingly.

In the opposite event, however, where the CCC budgets are more stringent than those prescribed by burden-sharing agreements in the EU, the UNFCCC or other international fora, there is no reason the UK should feel obliged to weaken its domestic targets and budgets. Instead, we advise that the government should cancel any spare carbon allowances awarded it by these bodies which exceed the emissions space it has allowed itself in a given period. We will expand on this in our answer to Question 11.

## **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.

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<sup>11</sup> Point 4.3 [http://ec.europa.eu/clima/policies/ets/reform/docs/com\\_2012\\_652\\_en.pdf](http://ec.europa.eu/clima/policies/ets/reform/docs/com_2012_652_en.pdf)

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 4<sup>th</sup> 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: No Comment

**Question 7** *In particular, does the possibility of shale gas in the UK change the economics of the fourth carbon budget?*

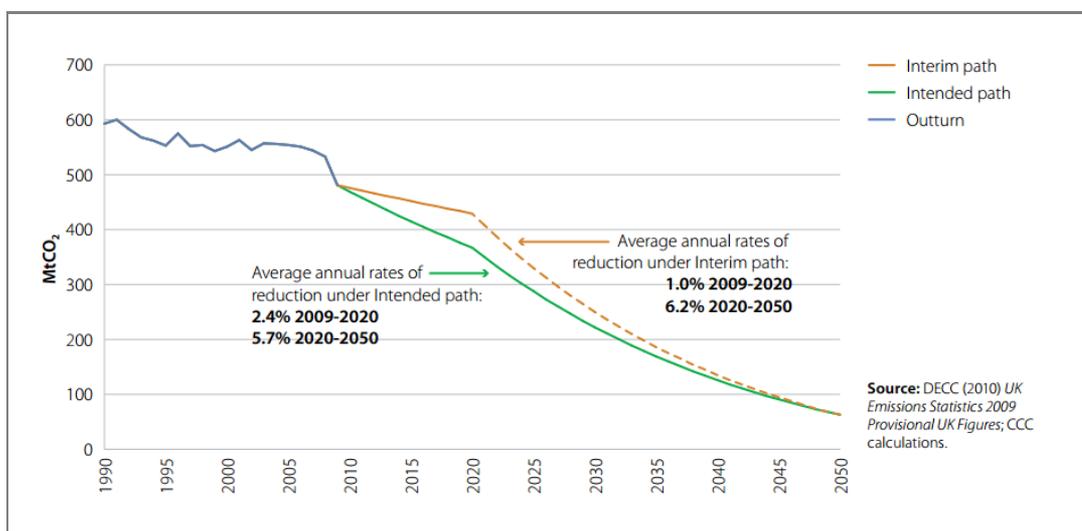
ANSWER: No Comment.

**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?*

Yes, the interim budget should be tightened.

Firstly, within its own terms of reference the CCC makes a compelling case that the carbon budgets should describe a roughly similar trajectory pre-2020 to post-2020 if the UK is to meet its 2050 climate target cost-effectively. If the pre-2020 trajectory is too weak this will require emissions over 2020-2050 to fall at a rate that would be extremely challenging and expensive for the UK.

**Exhibit 2: Steeper post 2020 reductions required by interim path**



Secondly, we note that the burden-sharing principles applied by the CCC, i.e. steady convergence in emissions from 2020 towards a common per capita level in 2050, fail to address the burning question of whether the UK is making an adequate contribution towards the peaking of global emissions in the next few years as is required if its own climate objective is to be met. As UNEP has highlighted in its 2012 Emissions Gap report, existing climate pledges out to 2020 remain insufficient to keep the world on track for cost-effectively avoiding two degrees.

Thirdly, as noted in Question 2, we feel that a more ambitious global budget (compatible with a >66% chance of avoiding 2°C) and a fairer effort sharing methodology should be applied when determining the UK's emissions trajectory (i.e. one which assigns emissions rights under the global budget on the basis of national share of global population in 1990). This methodology prescribes extremely stringent total carbon budget for the UK over 1990-2050 which do not allow it the luxury of spare headroom in the first three budgets.

### 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: No comment

**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: No comment

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

We note that the current design of the UK carbon budgets anchors them to the carbon budgets set under burden-sharing arrangements in EU legislation, in particular the EU Emissions Trading Scheme. At first glance this seems to limit the UK's autonomy in terms of its capacity to set its own budgets according to its own laws and its internal levels of ambition, but we feel this dilemma is easy to negotiate: **if the UK feels inclined to go further than the EU burden sharing arrangements currently allow, it can simply exercise its prerogative to cancel any EU allowances awarded it for auction which it feels are unwarranted.** In effect this allows the UK to unilaterally tighten the EU carbon budgets after burden sharing negotiations are complete, by forfeiting excess allowances.

We note that the CCC has prescribed that the 4th carbon budget (2023-2027) should be a "Domestic Action Budget" which seeks to ensure that UK emissions are accounted for on a gross basis, independently of any traded effort (either with Europe via the EU ETS, or internationally via Kyoto credits). While we agree with the CCC that the UK should pursue an aggressive programme of domestic decarbonisation if it is to cost-effectively meet its 2050 target in the Climate Change Act, we worry that a Domestic Action Budget that is lower than the corresponding budgets set at EU level would, have no environmental benefit on a *net* basis, as spare allowances from the EU Emissions Trading Scheme would be sold on to other EU Member States for their usage.

This should not deter the Committee from advancing a Domestic Action budget, but -- in order to protect the environmental integrity of that domestic budget and to prevent the UK from undermining the EU ETS -- it should prompt the CCC to support this proposal with a recommendation to cancel any EU carbon allowances over and above this domestic budget. We propose two mechanisms by which this cancellation might be achieved:

1. An ex ante cancellation: After calculating the volume of EU ETS allowances that are superfluous to domestic requirements under the 4th carbon budget, the UK could move to withdraw and cancel these from the quantity to be sold via the UK auction platform.
2. An ex post cancellation: At the end of the budget period, the UK could purchase back from the market any EU allowances exceeding those allowed under its domestic action budget. This could be funded through government receipts from the auctioning of ETS allowances and from the Carbon Price Support.

Cancellation of allowances under either of these proposals would imply a loss of revenue to the Treasury, but in both instances this loss stems from the UK rejecting allowances it feels are incompatible with its desired level of ambition, and to which the government feels it is not entitled. We argue that it is totally inappropriate that the UK

Treasury should profit from the sale of ETS emissions rights to companies and countries elsewhere in Europe which it is supposed to have foregone on environmental grounds.

We also note that any revenue lost from cancelling ETS emissions rights scheduled for UK auction would be partly offset by a rallying of the ETS carbon price as the market responds to the reduced supply. This would increase the value of any remaining UK allowances auctioned. This neutralising effect will be still greater if other large emitters in the ETS, especially Germany, cancelled spare allowances in tandem with the UK. Germany is the largest emitter in the EU ETS, supports similarly ambitious domestic targets and faces similar free rider problems if its domestic policies are not reflected in a tightening of EU emissions rights.