Committee on Climate Change

Independent advice to government on building a low-carbon economy and preparing for climate change

The Sixth Carbon Budget and Welsh emissions targets – Call for Evidence

Background to the UK's sixth carbon budget

The UK Government and Parliament have adopted the Committee on Climate Change's (CCC) recommendation to target net-zero emissions of greenhouse gases (GHGs) in the UK by 2050 (i.e. at least a 100% reduction in emissions from 1990).

The Climate Change Act (2008, 'the Act') requires the Committee to provide advice to the Government about the appropriate level for each carbon budget (sequential five-year caps on GHGs) on the path to the long-term target. To date, in line with advice from the Committee, five carbon budgets have been legislated covering the period out to 2032.

The Committee must provide advice on the level of the sixth carbon budget (covering the period from 2033-37) before the end of 2020. The Committee intends to publish its advice early, in September 2020. This advice will set the path to net-zero GHG emissions for the UK, as the first time a carbon budget is set in law following that commitment.

Both the 2050 target and the carbon budgets guide the setting of policies to cut emissions across the economy (for example, as set out most recently in the 2017 Clean Growth Strategy).

The Act also specifies other factors the Committee must consider in our advice on carbon budgets – the advice should be based on the path to the UK's long-term target objective, consistent with international commitments and take into account considerations such as social circumstances (including fuel poverty), competitiveness, energy security and the Government's fiscal position.

The CCC will advise based on these considerations and a thorough assessment of the relevant evidence. This Call for Evidence will contribute to that advice.

Background to the Welsh third carbon budget and interim targets

Under the Environment (Wales) Act 2016, there is a duty on Welsh Ministers to set a maximum total amount for net Welsh greenhouse gas emissions (Welsh carbon budgets). The first budgetary period is 2016-20, and the remaining budgetary periods are each succeeding period of five years, ending with 2046-50.

The Committee is due to provide advice to the Welsh Government on the level of the third Welsh carbon budget (covering 2026-30) in 2020, and to provide updated advice on the levels of the second carbon budget (2021-25) and the interim targets for 2030 and 2040. Section D of this Call for Evidence (covering questions on Scotland, Wales and Northern Ireland) includes a set of questions to inform the Committee's advice to the Welsh Government.

This response is from

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All answers provided here are informed by recent research and associated references, contained within the following paper, accepted for publication on 4th February 2020 and now in press:

Anderson, K,. Broderick, J,. & Stoddard, I,. 2020. *A factor of two: how the mitigation plans of "climate progressive" nations fall far short of Paris-compliant pathways.* Climate Policy, (in press).

All views contained here are attributable solely to the authors of this submission and do not necessarily reflect those of researchers within the wider Tyndall Centre.

A. Climate science and international circumstances

Question 2: How relevant are estimates of the remaining global cumulative CO_2 budgets (consistent with the Paris Agreement long-term temperature goal) for constraining UK cumulative emissions on the pathway to reaching net-zero GHGs by 2050?

ANSWER:

The IPCC's taxonomy for transposing "likelihoods" into probabilities provides a basis for translating the language of "well below 2°C" and "pursuing 1.5°C" of the Paris Agreement (PA) into numerical probability ranges. Building on this and the headline carbon budgets in SR1.5, Anderson et al estimate global carbon budgets specifically for the energy sector. Explicitly acknowledging the Paris Agreement's framing of equity and long-established concept of Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC), we proceed to estimate a Paris-compliant carbon budget for the UK's energy sector (this includes emissions from international aviation and shipping).

The estimated range is between 2.8 to 3.7GtCO2 from the start of 2020, for emissions from energy only; this compares with a budget implied in the CCC's 'net-zero' report of around 9GtCO2. Even using the higher 3.7GtCO2 estimate, the CCC's implied budget is some 240% larger than Anderson et al conclude is appropriate to meet the UK's Paris commitments.

The sequential reasoning for this profound divergence from the CCC's framing of Paris is detailed in Anderson et al. However, whilst there are a range of reasons for this divergence, the principal difference arises from [i] the CCC's implied allocation of a Paris-compliant global carbon budget to the UK; [ii] the CCC's reliance on future generations developing and deploying planetary-scale negative emission technologies (NETs).

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On this point [ii] (and based on earlier discussions with CCC personnel and in absence of anything to the contrary), a conservative reading of the quantity of NETs implied by the CCC's analysis is in the region of 4GtCO2 between 2035 and 2100. This value is solely for the UK and if increased, pro-rata, to the global level (on the basis of either population or emissions), would equate, very approximately, to half a trillion tonnes of CO2 removal by some form of future NETs (i.e. equivalent to 12-15 years of total current emissions.

Question 3: How should emerging updated international commitments to reduce emissions by 2030 impact on the level of the sixth carbon budget for the UK? Are there other actions the UK should be taking alongside setting the sixth carbon budget, and taking the actions necessary to meet it, to support the global effort to implement the Paris Agreement?

ANSWER:

Based on the response to Q2, the CCC's framing falls far short of anything approaching a reasoned and reasonable interpretation of the Paris Agreement. As such, if the UK is to align its budget framework with its Paris commitments, the CCC needs a root and branch rethink of its current position and mitigation recommendations. In brief, the analysis and conclusion of Anderson et al suggest the UK needs to deliver immediate mitigation rates, from its energy system, of over 10% per annum; this includes emissions from international aviation and shipping. Such a sea-change in ambition will require profound changes to many facets of contemporary society, and bring to the fore the huge asymmetry for responsibility of emissions and how polices need to be tailored to address the emissions of those individuals dominating high-emitting activities. No longer can addressing climate change be an incremental green complement to business as usual, delivered primarily through technical substitution incentivised through price mechanisms.

Such technocratic approaches may have been appropriate in 1990, and perhaps even in the early 2000s. Today, in 2020, and with the Paris Agreement tightening ambition to include 1.5°C, so the rapid penetration of low-carbon technologies and infrastructures needs to be complemented with legislation driving fundamental change to the high-carbon lifestyles of high emitters. Dress it up however we may wish, living within a tight and rapidly dwindling carbon budget is an issue of rationing.

As a complement to delivering mitigation inline with Paris-compliant carbon budgets, the UK should provide significant financial support, based on the principle of CBDR-RC, to 'developing country parties' to help them rapidly transition from high to low carbon development pathways.

Question 4: What is the international signalling value of a revised and strengthened UK NDC (for the period around 2030) as part of a package of action which includes setting the level of the sixth carbon budget?

ANSWER:

Whilst the CCC's 'net zero' position may have some short-term political merit, aligning its analysis and conclusions with a reasoned, transparent and ethical interpretation of the Paris Agreement (including the explicit consideration of CBDR&RC) would demonstrate both international leadership and integrity. Undoubtedly being an "early adopter" of such a politically and scientifically robust framework would face considerable backlash from some quarters. But set against an ongoing and widespread sea-change in engagement on climate change, the CCC may well find many unexpected and strong allies from within and beyond the UK. Whichever way international action plays out, if the global community

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is not to renege on Paris, an established and high-profile organisation has to be the first mover – or we fail on even 2°C. Given the high calibre of both the CCC's secretariat and its CEO, the CCC is well equipped to be such an established voice of reason and integrity.

B. The path to the 2050 target

Question 5: How big a role can consumer, individual or household behaviour play in delivering emissions reductions? How can this be credibly assessed and incentivised?

ANSWER:

Most emissions arise from the high-carbon activities of a relative few individuals, which suggests that effective climate policies within the rapidly dwindling global carbon budget will need to be tailored towards them/us .Chancel & Piketty frame this issue well in their 2015 report on carbon & inequality http://piketty.pse.ens.fr/files/ChancelPiketty2015.pdf

This will require a recognition that most of us working on climate change, from the scientists and academics through to the business leaders, journalists & barristers and on to the various climate agencies, policy makers and NGO chairs are all in the '10%' group of high emitters. Until we are prepared to acknowledge this huge emissions asymmetry we will continue to propose incremental policies and delaying technologies that masquerade as action aligned with Paris. This is not a small or flippant challenge. Normalised high-carbon behaviours and a belief in self-importance and personal-exception are not only rife but are locked into our current system of values and hierarchy.

Ultimately us foxes need to guard the chicken coup. No amount of literary eloquence or mathematical obfuscation can substitute for meaningful action that, most of us within this group, will judge as personally regressive, at least in the short-to-medium term. This nettle needs to be grasped, or the follow-up to the 'net-zero' report will only lock in the 'need' for yet more 'negative emission technologies'.

Incentivising such a radical departure from the current and wilful neglect of equity (this comment is not specifically aimed at the CCC) can only be experimental as we have few appropriate analogues (other than perhaps the fourteen years of rationing from 1940). For guidance on these issues, I suggest engaging with Professors Whitmarsh and McLachlan of the CAST centre https://cast.ac.uk and for understanding the relevance of historical analogues, Andrew Simms andrewsimms.uk@gmail.com of the Rapid Transition Alliance https://www.rapidtransition.org

Question 7: The fourth and fifth carbon budgets (covering the periods of 2023-27 and 2028-32 respectively) have been set on the basis of the previous long-term target (at least 80% reduction in GHGs by 2050, relative to 1990 levels). Should the CCC revisit the level of these budgets in light of the net-zero target?

ANSWER:

Question 7: The fourth and fifth carbon budgets (covering the periods of 2023-27 and 2028-32 respectively) have been set on the basis of the previous long-term target (at least 80% reduction in GHGs by 2050, relative to 1990 levels). Should the CCC revisit the level of these budgets in light of the net-zero target?

See responses to Questions 2 & 3.

In brief, if the UK is to maintain emissions within its fair Paris-compliant carbon budget and is not to rely on future generations deploying planetary-scale NETs, then the UK's existing budget framework needs to be urgently updated.

To hold within a 3.7GtCO2 energy-only carbon budget for the UK, energy emissions need to begin reducing immediately at over 10% per annum (including aviation and shipping). Given political, technical and social inertia, such reduction rates will take a few years to deliver. Consequently, the rates will need to rise to well over 10% p.a., with a fully decarbonised energy system achieved by around 2035. This is a very different agenda to the relatively incrementalist and technical-substitution framing of the 'net-zero' report.

C. Delivering carbon budgets

Question 12: How can a just transition to Net Zero be delivered that fairly shares the costs and benefits between different income groups, industries and parts of the UK, and protects vulnerable workers and consumers?

ANSWER:

See the response to Q9.

D. Sector-specific questions

Question 32 (Aviation and Shipping): In September 2019 the Committee published advice to Government on international aviation and shipping and Net Zero. The Committee recognises that the primary policy approach for reducing emissions in these sectors should be set at the international level (e.g. through the International Civil Aviation Organisation and International Maritime Organisation). However, there is still a role for supplementary domestic policies to complement the international approach, provided these do not lead to concerns about competitiveness or carbon leakage. What are the domestic measures the UK could take to reduce aviation and shipping emissions over the period to 2030/35 and longer-term to 2050, which would not create significant competitiveness or carbon leakage risks? How much could these reduce emissions?

ANSWER:

Drawing a line between today's aviation emissions and the CCC's proposed value for the sector by 2050 (~32MtCO2 for further ambition), followed by a drop to (real) zero emissions by 2075, suggests total emissions for the sector of a little under 1500MtCO2, or equivalent to around 40% of the UK's total Paris-compliant carbon budget for all sectors (i.e. 3.7GtCO2). Given the post 2050 assumption made here is a radical departure from the CCC's assumed 2020-2050 aviation emission trend, this 40% could be seen as an optimistic estimate. However, even at 40%, assuming such an allocation to a single sector that primarily serves a relative few high-emitting frequent flyers has severe implications for other

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sectors. This appears to be dealt with in the 'net zero' report, by assuming future generations successfully deploy large scale NETs to compensate for current and medium-term emissions; i.e. it avoids the need for the CCC proposing politically very challenging mitigation polices for the aviation sector. The alternative, and one that is a pre-requisite for meeting our Paris commitments, is stringent demand management, at levels more appropriately delivered through a geometrically rising frequent-flyer levy (or similar equity-based instrument) than through a highly regressive carbon tax.

Question 35 (Greenhouse gas removals): What relevant evidence exists regarding constraints on the rate at which the deployment of engineered GHG removals in the UK (such as bioenergy with carbon capture and storage or direct air capture) could scale-up by 2035?

ANSWER:

Whatever the evidence, the CCC's scenarios should exclude NETs.

The CCC (and indeed most IPCC WGIII) scenarios choose to exclude non-linearities in the climate system with the potential for large and irreversible changes. Yet the inclusion of NETs, characterised by similar high levels of uncertainty, though of a different category, is now deeply embedded at huge scale in the CCCs work and is ubiquitous in IPCC mitigation scenarios.

Favouring highly uncertain options (NETs) that help prescribe politically palatable mitigation futures whilst choosing to exclude other highly uncertain issues (various feedbacks) that increase the scale of the mitigation challenge, demonstrates a deep and disturbing systemic bias. The CCC need to reflect on this and be transparent in why they have chosen to rely so heavily on NETs yet exclude other issues of similar uncertainty.

For discussion on this issue and the implications of removing planetary-scale NETs from most scenarios see: https://science.sciencemag.org/content/354/6309/182.full and Anderson, K,. Stoddard, I,. & Broderick, J,. 2020. *A factor of two: how the mitigation plans of "climate progressive" nations fall far short of Paris-compliant pathways.* Climate Policy, (in press).