Campaigning for effective carbon markets

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Environmental Audit Committee Submission: Progress on UK Carbon Budgets

Sandbag is a UK-based NGO campaigning for environmentally effective carbon budgets and carbon markets. In the document which follows we:

- *critically examine the way the UK's long term emissions pathway was set under the UK Climate Change Act and the carbon budgets currently set by the CCC;*
- *propose and suggest the UK adopt an alternate effort sharing model as a more equitable alternative to the model on which the UK Carbon Budgets are currently based;*
- *evaluate the ambition of the UK against Europe using this new effort-sharing model;*
- *critically examine the basis for the reviewing the 4th carbon budget in 2014, based on developments in Europe; and*
- *propose that the UK unshackle its carbon budgets from the allocations set for it under the EU ETS by cancelling excess ETS allowances.*

1. Introduction: the importance of the 2008 Climate Change Act

1.1 We wish to start by acknowledging the ground-breaking importance of the 2008 Climate Change Act, the first legislation of its kind anywhere in the world to legally bind a state to 2050 emissions reductions and to set periodic budgets to ensure those targets are met.

1.2 The UK's ambition here has, undoubtedly, been an important factor encouraging other G8 countries and other EU Member States to make similarly ambitious pledges for 2050 emissions reductions and to start to passing legislation to meet those pledges.

1.3 Ground-breaking and progressive as the 2008 Climate Change Act was, we will argue in this submission that both the headline target in the Act and, more specifically, the budgets set beneath it by the Climate Change Committee describe an environmentally inadequate and inequitable emissions pathway for the United Kingdom.

1.4 We propose that the global emissions pathway chosen allows for an unacceptable level of climate risk and, more importantly, the effort sharing model used to determine the UK's pathway under this global trajectory is highly inequitable. That model is extremely *preferential* to rich countries with large emissions and small populations like the UK, and highly *prejudicial* against poor countries with low emissions and large populations like Bangladesh.

1.5 We will advance here an alternative effort-sharing framework, based on work by the German Advisory Council on Global Change and our own published research, which implies a much more ambitious emissions pathway for the United Kingdom than that envisaged by the Climate Change Committee.

1.6 Moreover, we will argue that current plans to review the 4th Carbon Budget against the levels of climate ambition in Europe and specifically in the EU ETS are firstly *premature*, insofar as they are scheduled to take place before the European decisions relating to that 2023-2027 budget period are

agreed, but are also *misplaced* insofar as climate ambition in the EU, though environmentally inadequate, is outpacing that in the UK.

1.7 Finally, we discuss how the UK's carbon budgets should be unshackled from the allocations set under the EU Emissions Trading Scheme to provide the government with more freedom in determining the emissions path it would like to pursue, without being beholden to EU legislation and legislative timetables. This can be readily performed through the cancellation of ETS allowances from UK auctions.

2. A critical assessment of the methodology behind the current UK emissions pathway

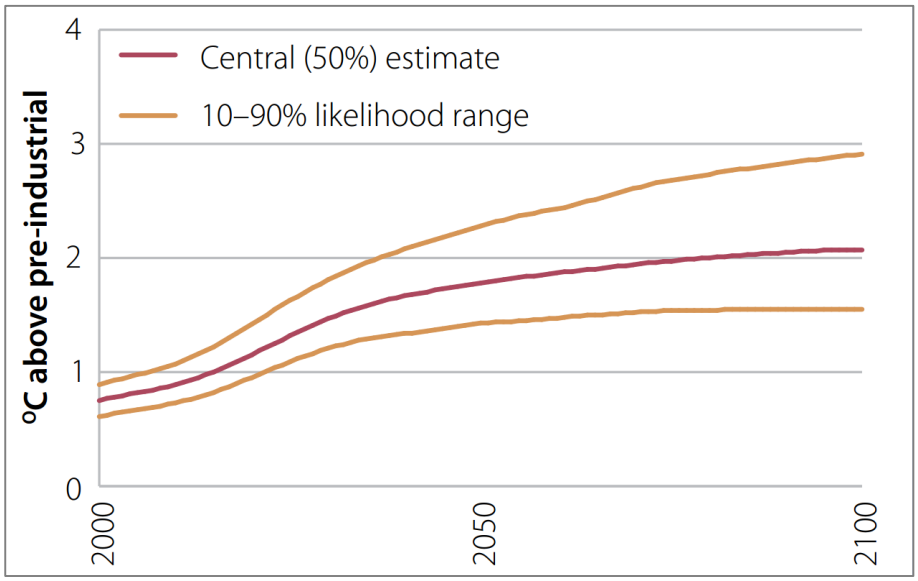
2.1 The logic by which the 80% target was determined and by which the carbon budgets towards it have been set it is eloquently laid out in a letter from the former Chair of the Committee, Adair Turner, to then Energy and Climate Secretary, Ed Miliband on 7th October 2008.[1]

2.2 Firstly, it is clear from that letter that the global emissions pathway envisaged by the Committee, and within which the UK pathway is set, has less than a fifty percent chance of avoiding 2˚C.

> "We therefore believe that global policy should seek to limit the central expectation [i.e. 50% probability] of global temperature rise to, or close to, 2°C and that it should ensure that the probability of crossing the extreme danger threshold of 4°C is reduced to an extremely low level (e.g. less than 1%)." (Emphasis added).

2.3 The Climate Change Committee hesitates between setting a global emissions pathway with an even chance of hitting 2 degrees (requiring global emissions to drop by 60% in 2050) and a pathway with an even chance of hitting 2.2 degrees (requiring global emissions to halve by 2050) seeming to hover somewhere in between. For the astute observer, this acceptance of a less than 50% chance of avoiding 2 degrees is apparent from the Climate Change Committee's own charts which visibly show the central estimate line landing slightly above the 2 degrees threshold.[2]

Figure 1: Global Temperature stabilisation under the envisaged global pathway



2.4 **We propose that committing to a global pathway which has a less than fifty-fifty chance of avoiding two degrees Celsius poses unacceptable climate risks, and is also a disingenuous application of the UK's commitment under the 2009 Copenhagen Accord, which states:**

[1] http://www.theccc.org.uk/wp-content/uploads/2013/03/Interim-report-letter-to-DECC-SofS-071008.pdf
[2] P.65 http://archive.theccc.org.uk/aws2/4th%20Budget/CCC-4th-Budget-Book_plain_singles.pdf

> "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"[3]

2.5 **A global pathway that is "very likely" (>75% chance) or, at the least, "likely" (>66% chance) to avoid two degrees seems to us far more consistent with this international pledge and seems a more appropriate reaction to the economic and environmental dangers posed by climate change. We also note that the science on emissions budgets has advanced since this global emissions pathway was modelled for the Climate Change Committee by the Hadley Centre.**

2.6 But the most critical parts of that letter are the following two sections. Firstly Lord Turner wisely points out that it is not the Committees role to make ethical judgements about the UK's share of global emissions on behalf of the international community.

> "The appropriate UK share of a global emissions target involves ethical judgements and will be the subject of international negotiations….It is not part of the Committee's remit to propose a specific methodology for the purposes on international negotiations.

2.7 But in the absence of a national or international political decision about the effort sharing approach that should be used in the international negotiations, the Climate Change Committee effectively defaulted to the effort sharing model used to decide the original -60% 2050 target in the Climate Change Bill, but updated to reflect more recent science in the 4th IPCC assessment report. The Committee has always been careful not to condone this particular effort sharing methodology, but presents this as *the minimum conceivable* effort that the UK might adopt. Continuing on from the paragraph quoted above, Lord Turner says:

> "[W]e believe that it is difficult to imagine a global deal which allows the developed countries to have emissions per capita in 2050 which are significantly above a sustainable global average. In 2050 the global average, based on an estimated population of 9.2 billion, would be between 2.1 to 2.6 tonnes per capita, implying an 80% cut in UK Kyoto GHG emissions from 1990 levels."

2.8 It is *indeed* difficult to imagine a global deal that is worse for developing countries and better for developed ones. The UK trajectory described in the 4th carbon budget report finds the UK consuming 1.1% of global emissions under the modest pathway used by the Climate Change Committee for 1990-2050[4], and this before accounting for its international aviation and shipping emissions. While this number looks small, the UK currently accounts for around 0.9% of the world's population, and is expected by the Committee to represent 0.8% of the global population in 2050. This suggests that the UK intends to exceed its fair share of the emissions space by more than a quarter.

2.9 By comparison, Bangladesh, which accounts for 2.2% of currently global population rising to 2.9% in 2050 receives only 0.5% of the 1990-2050 emissions space. In effect, Bangladesh risks having three quarters of its emissions space expropriated by richer countries under this approach.

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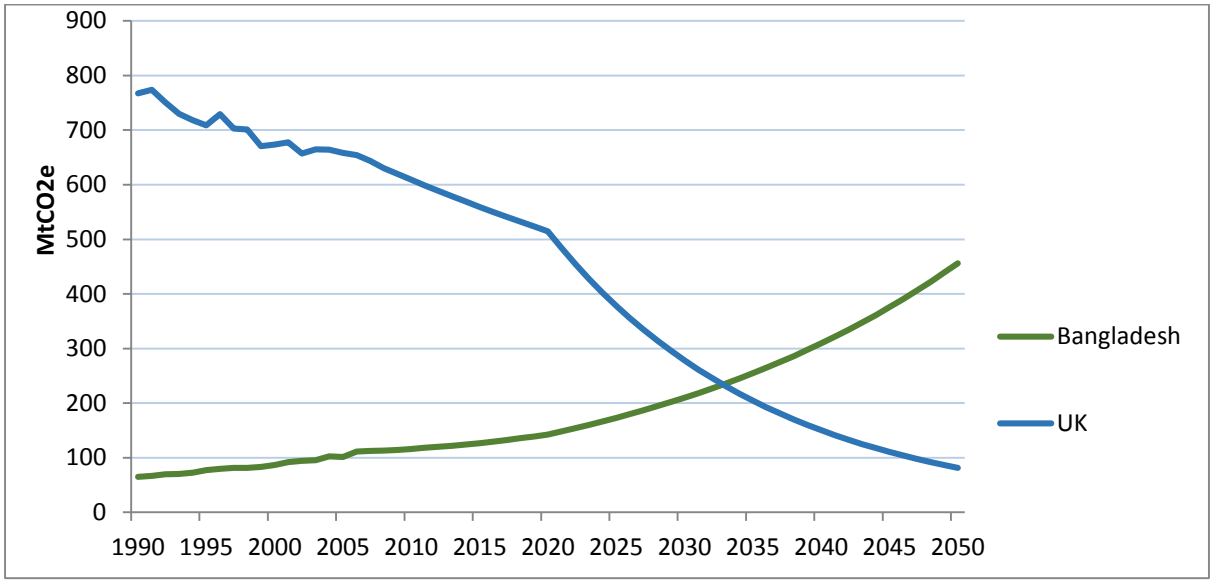
[3] http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf

[4] The CCC uses two scenarios from the Hadley Centre's MAGIC 4.11 model: a 2,423 Gt scenario and a 2,536 Gt scenario. See page 14 of http://downloads.theccc.org.uk/docs/Ch1%20technical%20appendix%20v1.1%20-%20projecting%20global%20emissions,%20concentrations%20and%20temperatures.pdf

Figure 2: UK vs. Bangladesh under the CCC's post 2020 convergence model



2.10 **The current UK emissions pathway is doubly compromised then. It allows for an unacceptably high risk of passing 2 degrees, and it applies an effort-sharing framework that is unacceptably prejudicial against poor countries.**

2.11 It is clear from Lord Turner's remarks that this was not a realistic effort-sharing model to form the template for a global climate deal. From the outset this was captured in the Committee's recommendation that "the emissions reduction target for those sectors covered by the Climate Change Bill should be *at least* 80%". The emphasis, here, is the Committee's own.[5]

2.12 Instead it is clear that the Committee expected its placeholder expectations about both the acceptable volume of global emissions, and the share of emissions to which each country was entitled to be adjusted in the light of a *more* ambitious offer from the UK government as part of the international negotiations. Instead, the tail is wagging the dog. These highly conservative Climate Change Committee budgets have defined the government's starting position on ambition, with the threat, if anything, of being further *weakened* by government intervention to review the 4th carbon budget if the government decides there have been insufficient advances in the EU's climate ambition.

2.13 We note, however, that the UK Government currently lacks an agreed yardstick by which to measure its own and Europe's efforts. In the following sections we scrutinize the placeholder effort sharing model applied by the Commission in more detail and present our own effort-sharing model which we suggest should be used as a fairer template for the government to apply as part of such an exercise.

3. Political compromise in the effort-sharing methodology selected by the Royal Commission for Environmental Pollution

3.1 The placeholder methodology used by the Climate Change Committee to determine the UK's effort sharing methodology was, as noted above, inherited from the Royal Commission on

[5] Page 1. http://www.theccc.org.uk/wp-content/uploads/2013/03/Interim-report-letter-to-DECC-SofS-071008.pdf

Environmental Pollution, who are very explicit in the approach that they endorsed: "the UK should be prepared to accept the contraction and convergence principle as the basis for international agreement on reducing greenhouse gas emissions".[6] This endorsement, however, seems to have been reached because of the Commission's excessive fears about the potential cost of mitigation if a fairer system were embraced.

3.2 The Royal Commission were acutely aware that there were important moral issues at stake. They reject outright the methodology by which emissions rights were awarded under the Kyoto Protocol because:

> "…the Kyoto Protocol was based on negotiated reductions from each developed nation's level of emissions in 1990. This approach gives those nations which have produced the most greenhouse gases to date an unfair advantage, in the shape of 'grandfather rights' to continue making the largest emissions. That does not seem a fair basis on which to proceed in the long term, nor one likely to win widespread support in the developing world." [7] (Emphasis added)

3.3 With equal moral insight, the Royal Commission expressed the view that "an effective, enduring and equitable climate protocol will eventually require emission quotas to be allocated to nations on a simple and equal per capita basis." (Emphasis added). The Commission seems to be on the brink of endorsing a genuinely equitable effort-sharing model, but their hesitation in doing so is clearly telegraphed from the use of the word "eventually". Instead of proposing a global emissions budget based on a pure per capita approach, they endorsed a particular interpretation of Contraction and Convergence®[8] instead. As the Commission explains:

> "Over the coming decades each nation's allocation would gradually shift from its current level of emissions towards a level set on a uniform per capita basis. By this means 'grandfather rights' would gradually be removed" (emphasis added).

3.4 **At what point did the Royal Commission argue that developing countries should finally gain parity of access to the global emissions space? Not until 2050 when the vast majority of the global emissions space will have been exhausted by rich countries like the UK.**

3.5 This application of Contraction and Convergence® continues to favour the largest historical emitters in rich developed countries by awarding them a disproportionate share of the emissions space at the expense of poor populous ones. Just like the Kyoto framework rejected by the Royal Commission, it is an approach which "grandfathers" emissions rights to the biggest polluters, deferring the point at which low emitting developing countries gain equivalent access to the global carbon space. It is by inheriting this approach that the Climate Change Committee prescribes a UK pathway under which the UK uses a share of the global emissions space 120% times larger than its population seems to merit.

3.6 The disenfranchisement of developing and emerging economies under this model makes it as unlikely a candidate for a global climate deal as the grandfathering methodology in the Kyoto Protocol that the Royal Commission dismissed. There is little chance that such a framework will be

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[6] http://web.archive.org/web/20070104105415/http://www.rcep.org.uk/pdf/chp4.pdf
[7] Page 56 http://web.archive.org/web/20070104105415/http://www.rcep.org.uk/pdf/chp4.pdf
[8] http://www.gci.org.uk/

embraced by populous, emerging economies such as the BASIC countries[9], or by developing countries in the G77 group[10].

3.7 But how did the Royal Commission reach this position? On this they were surprisingly frank: a fairer approach just looked too hard for the UK. Political expediency won out over fairness:

> "A system of per capita quotas could not be expected to enter into force immediately. At the same time as entitling developing nations to use substantially more fossil fuels than at present (which they might not be able to afford), it would require developed nations to make drastic and immediate cuts in their use of fossil fuels, causing serious damage to their economies."

3.8 This analysis also seems to underestimate the extent to which trading of emissions rights could reduce the need for high emitters to cut their domestic emissions, lowering their mitigation costs and softening the economic impact by buying spare emissions rights from developing countries or paying for cheap abatement opportunities elsewhere in the world. It also neglects that developing countries should be entitled to *grow* their economies through the sale of emissions space that is rightfully theirs.

3.9 While we share the understanding expressed in Contraction and Convergence® that a just transition will inevitably involve a gradual convergence of *emissions* between developed and developing countries, we argue that this should not be taken to imply a deferred convergence of *emissions rights*. Poor countries should not be disenfranchised from their fair share of a new global resource by virtue of being low emitters. Equivalent access to emissions rights under a 2°C emissions budget should be conferred to developed and developing countries from the outset.

4. A fairer effort sharing model for the UK carbon budgets and targets: The Sovereign Emissions Rights Framework

4.1 At Sandbag, we have published our own effort sharing model as part of the European Commission Consultation on a 2015 International Climate Agreement: *The Sovereign Emissions Rights Framework*.[11] Our approach seeks to provide a fair model of how emissions rights might be awarded to ensure that all countries internalise their fair share of the costs involved in mitigating global emissions within a global carbon budget compatible with a "likely" chance (>66%) of cost-effectively avoiding 2 degrees. We propose that:

- The total global greenhouse emissions budget to 2050 should be back-calculated from 1990, when the dangers of climate change were first globally acknowledged following from the IPCC's first assessment report.
- This 1990-2050 budget should be divided between nations based on their share of global population in 1990 at that particular moral and epistemological milestone.
- This new agreement should supersede previous agreements and all historic territorial emissions produced since 1990 should be counted against these national budgets, as well any as awarded emissions rights or offset credits issued under the Kyoto Protocol.
- All fossil and industrial CO_2 emissions under those national budgets should be tradable between countries, either at state level or through devolved cap and trade schemes, to

[9] Brazil, South Africa, India, China
[10] Now incorporating 132 developing countries, including some "emerging economies" like China
[11] Damien Morris, The Sovereign Emissions Rights Framework (Sandbag, June 2013) http://www.sandbag.org.uk/site_media/pdfs/reports/The_Sovereign_Emissions_Rights_Framework.pdf

allow cost-effective emissions reductions to be realised while ensuring ultimate financial responsibility for these reductions is appropriately apportioned.

4.2 We emphasise that Sandbag is not unique in advocating this kind of budgets approach, that divides the total global budget based on population in one specific date. The German Advisory Council on Global Change published a very similar approach in a landmark paper in 2009,[12] and as early as early as 1989 Professor Michael Grubb, a founding member of the Climate Change Committee argued that:

> "There is only one really solid basis for allocation. That is to recognize equal per capita entitlements to carbon emissions: and, consequently, initially to allocate carbon emission permits in proportion to national population. The moral principle is simple, namely that every human has an equal right to use the atmospheric resource."[13]

4.3 **By following the approach outlined above, we find that the UK is 66% of the way (16 billion tonnes) through its 25 billion tonne budget for 1990-2050. That leaves it just over 8 billion tonnes to use out to 2050. The UK will exhaust its remaining equitable budget under this framework by 2017 without a step-change in its domestic and internationally traded effort.**

5. Comparing UK and European effort under the 4th Carbon budget using the SER framework

5.1 In the table below we explore how far the UK has progressed through this budget compared with the EU27 and the world as a whole, noting that the UK is further through its budget, owing to its high rate of emissions since 1990 relative to its 1990 population.

Table 1: Emissions budgets under the Sovereign Emissions Rights Framework

Country/region	Share of 1990 global popⁿ	1990-2050 budget under 66% chance of avoiding 2˚C (Gt CO_2e)	Emissions produced 1990-2012E (Gt CO_2e)	Share of budget already used
Global budget	100%	2,274	1,024	45%
EU27 budget	9%	204	116	57%
United Kingdom	**1%**	**24.6**	**16.3**	**66%**

Sources: UNEP 2012 Emissions Gap report gives a 1,890Gt global budget for 2000-2050 of which 640 is estimated to have been used by 2012. To both figures we have added in 384Mt of estimated 1990-1999 emissions from Stockholm Environment Institute
1990 population figures taken from the CIA World Factbooks
UK and EU27 emissions for 1990-2012 taken from the European Environment Agency as reported to the UNFCCC (net emissions including LULUCF and bunker fuels and early 2012 estimates from Eurostat.
Figures are approximate and have been rounded

5.2 Europe, then, is also dangerously close to exhausting its equitable emissions budget, and will exhaust its emissions space by **2033** under the budgets implied by the 2020 framework and the milestones in the 2050 Low Carbon Roadmap without a step change in its domestic and international effort. **While this suggests that Europe needs to go much further, the UK has considerable catching up to do if it even to match Europe's inadequate levels of climate ambition. Using an equitable per capita approach, the UK, then, will compare unfavourably**

[12] WBGU, Solving the Climate Dilemma (2009) http://www.wbgu.de/fileadmin/templates/dateien/veroeffentlichungen/sondergutachten/sn2009/wbgu_sn2009_en.pdf

[13] Michael Grubb, *The Greenhouse Effect: Negotiating Targets* (Royal Institute of International Affairs, 1989)

in any test of its climate efforts against Europe for the period governing the 4th carbon budget.

5.3 With Europe as a whole committed to much higher levels of abatement relative to its historic emissions, and therefore streaks ahead of Britain in terms of its climate ambition, we can easily predict the outcome of such an effort comparison, but we note that, strictly speaking, a precise comparison cannot take place until the European Emissions pathway for 2023-2027 is completed. This is especially true in relation to the budgets set under the EU Emissions Trading Scheme as we explore below.

6. Generous carbon budgets in the EU Emissions Trading Scheme are holding back UK effort

6.1 As we seek to demonstrate above, it is not a problem with EU *ambition* that is blocking ambition in the UK as is sometimes proposed. Instead this is an artefact of differences in the way that ambition in the UK carbon budgets and the EU emissions trading scheme are currently determined.

6.2 When setting the carbon budgets for the UK, the Climate Change Committee initially decided to separate out the component of that budget to be reached by the sectors covered by the EU Emissions Trading Scheme (e.g. power stations, factories, airlines) against those that weren't (e.g. transport, heating, agriculture). Emissions in traded sectors were deemed to be equivalent to the levels of *allocations* in the ETS with any physical emissions over or under these allocations deemed to have been 'offset' with tradable permits.

6.3 The decision to account for traded emissions in this way was based on the support for flexible policies such as the ETS which enabled least-cost compliance. But having embarked on this accounting methodology it has become very difficult for the Climate Change Committee to recommend budgets which depart from those set under the ETS.

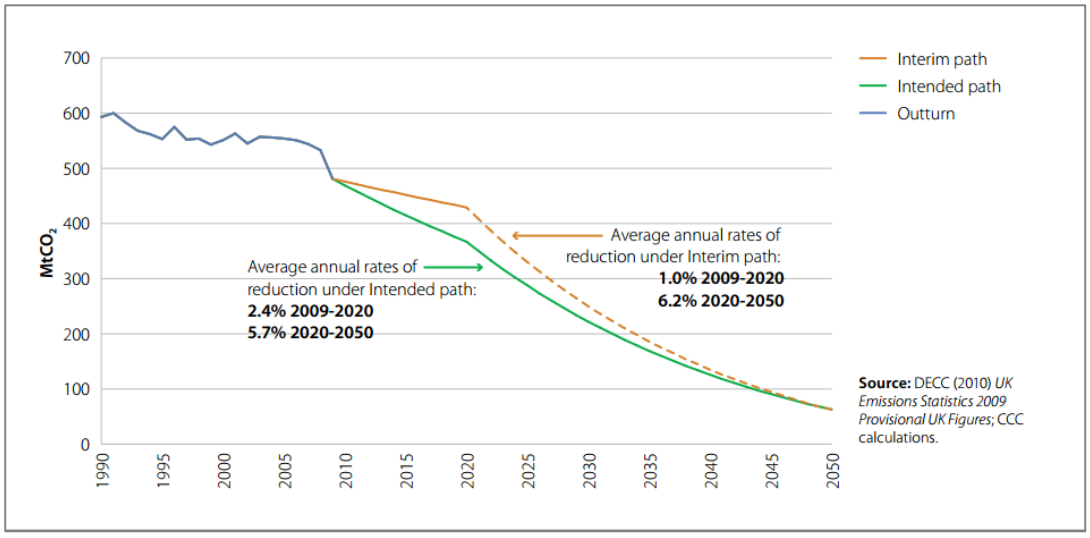
6.4 **Unfortunately, the EU methodology for awarding emission rights under the EU ETS is far more generous to the UK than Britain's own effort sharing methodology.** While the EU has not displayed less *ambition* than the UK, its harmonised methodology for awarding emissions rights under the Emissions Trading Scheme is more *advantageous* to the UK than to other countries. This is because, while the UK's budgets are set under a model based on Contraction and Convergence, Emissions rights under the EU ETS have largely been awarded by "grandfathering" which, as the Royal Commission noted, is even *more* favourable to the largest emitters. As the UK is the second largest emitter in the EU ETS after Germany it is has been one of the biggest beneficiaries of this allocation methodology. The UK has received 12% of the ETS allowances awarded to all 30 participating countries over 2008-2012[14], it will receive 11% of all ETS allowances available for auction from 2013[15], and it will also be awarded free allocations on the same basis as countries like Sweden and Norway who have a much lower responsibility for historic emissions and have also been more successful in limiting their greenhouse gas pollution.

[14] Phase 2 of the EU ETS, corresponding to first Carbon Budget and the first Kyoto Commitment Period
[15] 88% of future auctioning rights are awarded on the basis of national shares in EU27 emissions in 2005. The UK accounts for 237Mt (12%) of ETS emissions in that baseline year. See article 10 of the ETS Directive http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2003L0087:20090625:EN:HTML

6.5 Ironically, because the current accounting methodology for the UK carbon budgets is fixed to the incompatible allocation methodology in the EU, Europe's *generosity* to Britain under the ETS threatens to derail the ambition of the UK carbon budgets.

6.6 This has already been observed with the first three carbon budgets. Recognising that UK ambition was in many ways tied to that of the EU as a whole, the CCC recommended two proposed levels for these budgets – the 'Intended Budgets' and the 'Interim Budgets'. The CCC hoped that the Intended budgets would be adopted in the event of an increase in ambition at an EU level as part of a new global deal being reached in Copenhagen. This deal never materialised which lead to the Interim Budgets remaining in place. This "interim" pathway now threatens to take the UK dangerously off track from its desired trajectory, demanding a steeper and costlier abatement path later on if it is to get back on track.

Figure 3:Future emissions reductions required against the interim and intended budgets[16]



6.7 Observing this danger, as part of its advice to the government, the Climate Change Committee has recommended that the first three budgets now be reduced to the level of the Intended Budgets in recognition of the fact that the Interim Budgets are no longer very challenging after the recession, and therefore represent an unnecessary deviation from the desired trajectory. This has not, however, been accepted by Government thus far.

6.8 Even here, the Committee has been hamstrung in the level of ambition it can suggest for these three budgets by the way emissions from the traded sector are currently fixed against the allowances awarded to the UK under the EU ETS. It has therefore only been able to propose that the *non-traded* sections of the first three budgets be tightened:

Figure 4: The CCC's propose tightening of the non-traded sections of the first three budgets

[16] Figure 10 CCC 4th budget report

Table 1: Proposed tightening of second and third budgets to include Intended budget for non-traded sector			
	Budget 1 (2008-2012)	**Budget 2 (2013-2017)**	**Budget 3 (2018-2022)**
Interim budget	**3018**	**2782**	**2544**
Interim traded	1233	1078	985
Interim non-traded	1785	1704	1559
Intended budget	**3018**	**2679**	**2245**
Intended traded	1233	1009	800
Intended non-traded	1785	1671	1445
Proposed tightened budget	**3018**	**2749**	**2430**
Interim traded	1233	1078	985
Intended non-traded	1785	1671	1445
Source: CCC analysis.			

6.9 To prevent UK ambition from continuing to be hamstrung in the future, the Climate Change Committee has now proposed that the 4th carbon budget should be a "Domestic Action" budget of 1,950 million tonnes, accounted separately from any emissions traded in under the EU ETS:

> "This budget should be legislated in the first instance, with the aim to achieve it through domestic emissions reductions only (i.e. without recourse to purchase of credits in international carbon markets, including through the EU ETS)."

6.10 We fully concur with the Climate Change Committee that the 4th and future carbon budgets need to be disaggregated from the EU ETS to ensure a minimum level of ambitions is reached, and also to allow the UK to set its budgets without being beholden to the timescales of EU legislation. However, we note it is not within the power of the Climate Change Act to deprive UK installations in the ETS from meeting their compliance obligations under that policy through traded effort. Consequently, new accounting techniques will be necessary to protect UK budgets from excess UK allowances awarded under the EU ETS and to protect any environmental gains made through increased UK ambition.

7. Unshackling the UK carbon budgets from the EU ETS

7.1 As it is Europe's excessive *generosity* to the UK under the ETS that is holding back ambition in the UK's carbon budgets, rather than any shortfall in EU ambition, this offers Britain a fairly straightforward solution: **cancel any ETS allowances awarded it by Europe which exceed those it feels is appropriate for its own traded sector for the relevant budget period.**

7.2 Retiring allowances scheduled for auction in the years corresponding to future UK carbon budgets would readily allow the UK to maintain its desired levels of national ambition without being held back by the allowances distributed under the EU Emissions Trading Scheme. At the same time it would still afford the UK all of the flexibilities afforded by Emissions Trading to meet these national budgets.

7.3 An alternative to this *ex ante* methodology would be an *ex post* adjustment where the UK would seek to purchase and cancel any ETS emissions rights above and beyond its desired internal budget at the *end* of each UK carbon budget period using receipts from ETS auctions and from the Carbon Price Support.

7.4 Both of the options described above would serve to unshackle UK ambition from the EU ETS, without losing the flexibilities afforded by that policy. Furthermore, they ensure that the additional climate ambition of the UK results in real emissions reductions**. A Domestic Action budget, as proposed by the Climate Change Committee, will not change the total volume of emissions allowances issued under the ETS, unless unused UK allowances are cancelled in a manner similar to those we have described above.** Some form of ETS cancellation is paramount to ensure that any additional efforts from the UK do not simply serve to take the pressure of other states participating in the EU ETS.

7.5 Cancellation of allowances under both 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 also note that these revenue losses could be considerably diminished if other large emitters in the EU ETS, most notably Germany, were encouraged to adopt similar measures. If sufficient allowances were cancelled by large emitting member states, the market price of ETS allowances would rise, making this cancellation revenue neutral to the treasuries involved. A similar proposal has been persuasively argued in the past by Professor Michael Grubb, a former member of the Climate Change Committee.[17]

8. Conclusion

8.1 While in these last sections we have argued that the UK carbon budgets should be liberated from the EU ETS, to allow them to reduce national emissions faster, this should not be taken to suggest that that the UK's current pathway is adequate, or that its ambition is outpacing Europe's.

8.2 The ETS has waylaid the UK ambition because it has diluted the UK's lenient effort sharing methodology (an application of Contraction and Convergence) with a weaker one (grandfathering) that is even more preferential to Britain. It is not, we emphasize again, a result of UK ambition outstripping Europe's.

8.3 As we prepare to agree a new climate deal in 2015 which might be the world's last realistic chance of avoiding dangerous climate change, the UK should look to support a global emissions pathway that is likely to avoid two degrees, and should promote and adopt an effort sharing system which has a realistic chance of gaining the support of developing and especially emerging economies like China. An environmentally adequate global deal is unlikely to be reached while rich industrialised countries seek to expropriate emissions space from poor developing ones.

8.4 In this paper we have presented an effort sharing model which we feel represents an equitable framework that might serve as a reference point for the political negotiations towards a new pledges in a new climate deal.

8.5 Our recommendations in summary are that the Government should:

- Embrace a global pathway which involves at least a 66% chance of avoiding two degrees of warming against pre-industrial levels. According to the UN Environment

[17] http://news.bbc.co.uk/1/hi/sci/tech/8000156.stm#comments

Programme this leaves 1,250 billion tonnes over 2013-2050[18] and implies a 1990-2050 budget of **2,274 billion tonnes**[19]. By contrast the global pathway currently assumed by the UK assumes **2,423 - 2,536 billion tonnes of emissions**[20]

- Support an effort sharing model which equitably divides up the 2 degree emissions space on an equitable per capita basis. We argue that the fairest approach would retroactively apply this per capita division to 1990 when the dangers of climate change were widely globally recognised.

- Unshackle the UK carbon budgets from the EU ETS, which is waylaying UK ambition by awarding the UK too many allowances. This can be achieved through an *ex ante* cancellation of UK allowances scheduled for auction, or an *ex post* purchase of ETS allowances by the government.

[18] UNEP, *The Emissions Gap Report 2012* (UNEP, December 2012)
[19] Sandbag calculations using UNEP and historical emissions data from the Stockholm Environment Institute
[20] MAGICC 4.1 as appearing in the Technical Appendix to the Climate Change Committee's first Carbon Budgets report