

How UK Climate Change Committee steals from the carbon budget

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With the COP 26 international climate talks coming up in Glasgow in November, the UK government's greenwash machine is going into overdrive.

The prime minister has set the tone with a "ten point plan" on climate – denounced as empty rhetoric by researchers (e.g. [here](#) and [here](#)) – which in turn is linked to the government's new [target](#), to cut greenhouse gas emissions by 78% of 1990 levels by 2035.

That target is linked to the sixth carbon budget for 2033-37, proposed by the Climate Change Committee (CCC) that advises the government.

The CCC has warned that the government is on track to miss the targets for fourth budget (2023-27) and the fifth budget (2028-32), and often made valid proposals for decarbonisation measures. For this it has been praised by Labour politicians, some environmentalist organisations and some climate scientists.

But looking coherent, compared to the government, is a very low bar to jump over. The CCC's carbon budgets are not a realistic guide to the UK playing its part in tackling climate change – and are used by government ministers and other politicians to obstruct and delay effective action.

The way the CCC budgets are calculated would allow the UK economy to emit at least twice as much greenhouse gas as any amount that could possibly be described as its fair share.

In the article below, and a linked article on how a UK carbon budget could be set, Peter Somerville explains why.

To preface Peter's arguments, here are a few words about what carbon budgets are, and why they matter.

■ Global carbon budgets are measurements of the amount of carbon dioxide that scientists estimate can be put into the atmosphere, before global warming breaks certain barriers. The budgets are often stated in gigatonnes of carbon dioxide emissions (GtCO₂). The barriers are usually stated as global average temperatures, measured in degrees centigrade above pre-industrial levels.

■ Global carbon budgets are the products of scientific research. There are some good visualisations on the Global Carbon Project web site (go [here](#) and scroll down to "The carbon budget for 1.5°" and "Remaining carbon budget to 1.5° and 2°").

■ In reports by the Intergovernmental Panel on Climate Change (IPCC), the budgets are set out in tables that provide scientists' best estimates of the remaining carbon budget available, to keep global temperatures to certain levels. The IPCC [Special Report on Global Warming of 1.5 degrees](#), published in 2018, said that, to limit warming since 1850-1900 to 1.5°, the remaining global carbon budget is 840 GtCO₂, for a 33% chance of hitting the target; 580 GtCO₂ for a 50% chance; and 420 GtCO₂ for a 67% chance. The scientists also provided estimates for a range of other temperatures and likelihoods. You can see the key table (Table 2.2 in chapter 2) [here](#).

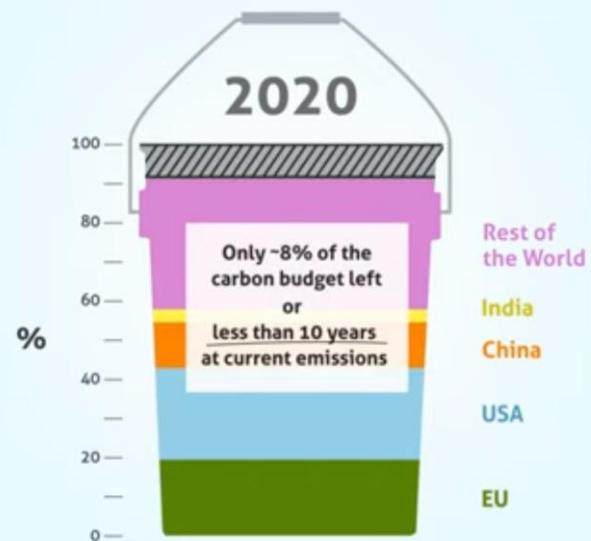
■ There are uncertainties in climate science. These figures shift, as research teams refine their estimates. In the IPCC

sixth assessment report, due out next year, the budgets are likely to be smaller than in previous reports.

■ Carbon budgets deal with CO₂ emissions, that account for about three-quarters of the global warming effect. Scientists have developed budgets for other greenhouse gases, that collectively account for the other one quarter. [Methane](#) and [nitrous oxide](#) are the most important ones.

■ Global carbon budgets are worked out by science, but national carbon budgets are set by politics. They reflect

The carbon budget for 1.5 degrees



The global carbon budget from 1800 onwards (with a view to limiting global warming to 1.5 degrees) as a bucket, which is nearly full. A graphic by the [Global Carbon Project](#)

what countries' politicians decide is (i) a reasonable global budget to aim at, and (ii) their country's fair share of that budget.

■ The CCC takes as a starting-point scientists' global budgets that give humanity a 50% chance of hitting the 1.5 degree target (see the [Sixth Carbon Budget report](#), pages 367-371) – which is itself a political decision. But it is not easy to see how it does the sums.

■ Researchers who have done their own sums say that the CCC is allowing the UK a share of the global budget that is disproportionate, and unfair to nations of the global south – in other words, *stealing from the global budget*.

■ A [key research paper](#) by scientists at the Tyndall Centre argued last year that the UK's carbon budget for the rest of this century should be **no more than half** the figure the CCC is working with – that is, carbon emissions cuts have to be *twice as stringent*.

- The CCC does not say what proportion of the global budget it thinks the UK could fairly use. Instead it starts with what it deems to be “feasible limits for ambitious but credible emissions reductions targets in the near term” ([Sixth Carbon Budget report](#), pages 319-325). That is, it makes a **political judgement** about what a rich country with a long history of fossil-fuel-infused imperialism should do.
- The CCC also tweaks its numbers by assuming – despite the lack of technological evidence – that large-scale carbon dioxide removal will soon be possible.

The CCC’s work is taken as a starting point for discussions of the UK’s carbon budget, and for emissions reduction plans by local governments, and for trade unions’ and environmental organisations’ climate policies. But, Peter Somerville argues, its approach does more to conceal than to clarify what needs to be done to tackle climate change. Simon Pirani

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The Climate Change Committee and its Sixth Carbon Budget

By Peter Somerville

The Climate Change Committee (CCC) is the mouthpiece in the UK of status-quo-supporting ecomodernism. It believes that capitalist growth must continue and that climate catastrophe can be averted by suitable planning and management, using new technology and government regulation, with a minimum amount of public investment plus a certain amount of behaviour change.

Radical social change is simply not on the CCC’s agenda.

Under the Climate Change Act 2008 (as amended by the Climate Change Act (2050 Target Amendment) Order 2019), the CCC is required to set five-yearly carbon budgets to reach net zero carbon by 2050. The government is required to develop policies and proposals to meet these budgets.

The first and second budgets (2008-2017) [were met](#) only because of austerity, higher fossil-fuel prices and the outsourcing of carbon emissions, so the government didn’t need to do anything at all and effectively [did very little](#). The third budget (2018-22) is already well outperformed, due to the Covid 19 pandemic – so much so that the fourth budget

(2023-27) could be met without the government doing anything.

All this strongly suggests that the budgeting process involves a laborious and bureaucratic [“discourse of delay”](#), having the effect that governments feel that they do not have to act with any great sense of urgency ... and that when they do have to act, it is sufficient to act incrementally, with minimum disruption to business as usual.

The CCC, however, see it differently. They have developed what they call a Balanced Net Zero (BNZ) pathway. They recognise that the 2015 [Paris Agreement](#) on climate change requires the “highest possible ambition”, but they believe that a pathway that realistically reaches net zero by 2050 is evidence of that ambition.

This pathway, however, is seriously lacking in ambition in three main respects:

- First, as Kevin Anderson and his colleagues at the Tyndall Centre for Climate Change Research have [pointed out](#), the carbon budget set for UK emissions to reach net zero by 2050 needs to be far smaller than allowed for by following this pathway. This is mainly because the pathway does not account for the UK’s historical responsibilities, and relies heavily on negative emissions technologies that do not currently exist at scale.

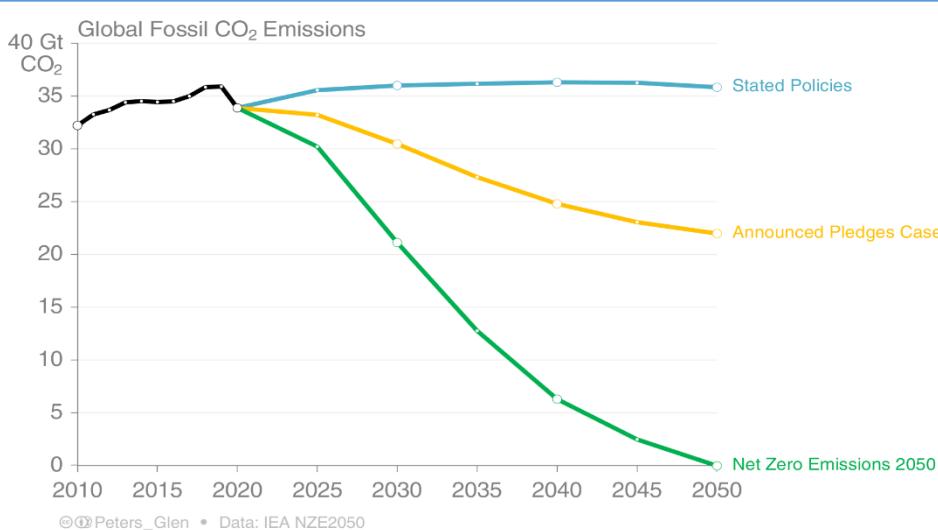
The CCC’s pathway is also based on the assumption of only a 50% probability of limiting global heating to 1.5 degrees centigrade (the [Sixth Carbon Budget report](#), page 39) – which few people would agree represents an acceptable degree of confidence. In contrast, the [Climate and Ecology Bill](#), proposed by a cross-party group of MPs, states that a plan is required that has at least a 66% probability of this outcome.

- Second, net zero is not enough, because it is necessary for the UK to make its fair contribution to reducing the concentration of greenhouse gases in the atmosphere, which is already too high. The level of CO₂ is [417 parts per million](#), well above a safe level of 350 parts per million. It is stopping this level rising, as soon as possible, that is the key to limiting global temperature rise. Far from being the maximum level of ambition, the BNZ pathway is actually the minimum level of ambition.

- Third, the CCC is proud of insisting that early action is needed but, as the first three budgets have shown, the weighting towards early action has not been nearly strong enough. Rather than a linear path towards 2050, with roughly the same annual emissions cuts in percentage terms, the proportions of emissions reductions required in the earlier periods should have been much higher.

This did not happen, primarily because the CCC is legally required to reach its target at minimum cost to the public purse. This false economy, perhaps more than anything else, is responsible for the climate emergency that now faces us.

The BNZ states that decarbonisation policy



This graph is by [Glen Peters, a climate researcher](#). It compares CO₂ emissions along a global pathway to “net zero” in 2050 (green), a pathway reflecting the promises made by governments (yellow), and a pathway reflecting current government policies (blue)

should focus on four key areas, shown in the Table:

Key areas of the BNZ pathway (Source: Sixth Carbon Budget report, pages 25-26. See also page 68)	
Key area	Emissions savings 2019-2035
Reducing demand for carbon-intensive activities <ul style="list-style-type: none"> - Shift in diets away from meat and dairy, reductions in waste, slower growth in flights and reductions in travel demand (10% savings) - Improved energy efficiency of buildings, vehicles and industry (5% savings) 	15%
Take-up of low-carbon solutions: vehicle electrification, boiler replacement, and use of electricity or hydrogen or CCS in industry	50%
Expansion of low-carbon energy supplies <ul style="list-style-type: none"> - 100% low-carbon electricity, mainly from offshore wind (18% savings) - 90 TWh of low-carbon hydrogen from electricity, or from natural gas or bioenergy both with CCS (5% savings?) 	20%
Land (and removals) <ul style="list-style-type: none"> - 440k Ha of woodland to capture CO₂ - 260k Ha of agricultural land shifted to bioenergy crops 	11%

Looking at these four areas, it can be seen that the CCC has too little of the right kind of ambition, and too much of the wrong kind of ambition.

It lacks ambition on renewable energy, as it simply accepts the government's plan to build 40GW of offshore wind power capacity by 2030, with no mention of other possible sources such as onshore wind and solar power.

Arguably, the CCC also lacks ambition on [retrofitting buildings](#). In its BNZ pathway, buildings emissions would only be reduced by half by 2035. The proposal for 5.5 million heat pumps by 2030 ([page 328](#)) sounds a lot ... but it means that more than 20 million homes will continue to be heated by gas.

Lack of ambition is also prevalent in the CCC's neglect of public transport and industry regulation, and in its acceptance of aviation growth.

Perhaps to make up to some extent for this lack of ambition, the CCC is very ambitious in its advocacy of hydrogen, carbon capture and storage (CCS) and land use change. These ambitions, however, are all problematic.

One problem for the CCC is that hydrogen plays a role in all of their scenarios, but they lack a clear framework for decarbonising it.

In the BNZ, [hydrogen](#) is used in hybrid heat pumps, in industry, in energy supply, and in energy storage.

This might be acceptable if the hydrogen is to be "green" – that is, zero carbon, produced, for example, by the electrolysis of water. However, the CCC's projections assume that much of the hydrogen will be "blue" – that is, produced by processing natural gas such as by steam reforming of methane, and capturing the carbon dioxide that is emitted in the process. Such technology does not currently exist at scale.

A limited amount of hydrogen could be produced from organic waste, but on nothing like the scale envisaged in the BNZ.

Hydrogen could well be "vital in providing flexibility to deal with intermittency in the power system" ([page 25 of the](#)

[report](#)), but it needs to be green. Arguably, a clear pathway to decarbonising hydrogen is needed.

The [problems with CCS](#) are well-known, and so will not be repeated here. What the CCC is proposing, however, is truly staggering. It appears to assume that much of industry will continue more or less as usual, except that it will increasingly use CCS – when, obviously, if industry were required to switch to using renewable energy this would not be necessary.

CCS is also expected to enable the production of low-carbon hydrogen, which is needed only because the BNZ is not ambitious enough in its renewable energy pathway.

Worst of all, however, the CCC expects 260,000 hectares of agricultural land to be shifted to growing bioenergy crops: that is, more than 1000 square miles, or twice the area of Greater Manchester. This is undeniably ambitious ... but it is the wrong kind of ambition.

The BNZ assumes that a shift of diet away from meat and dairy (20% by 2030, 35% by 2050) will free up a great deal of agricultural land, but the CCC does not explain how this shift is to occur.

It may be worth mentioning here that the main producer of bioenergy in the UK, and the largest single emitter of carbon dioxide in UK, namely [Drax power station](#), had its own representative on the committee ... until last month, when she quit, in the midst of a furore over the "[glaring conflict of interest](#)" in her appointment.

Three final points are worth noting:

First, the CCC have never acknowledged any clear UK responsibility for reducing emissions embodied in imported products (e.g. emissions from Chinese steel plants manufacturing products exported to the UK), even though the increased consumption of these products is the main



reason why the UK's carbon footprint has fallen only slightly since 1990.

According to the CCC's [report](#): "In 2017 the UK consumption emissions footprint was 16% below 1990 levels" (page 346). Although it makes a passing reference to the introduction of "effective trade measures and product standards", and "border carbon adjustments" (page 347), the CCC continues to assert that it is other countries that are mainly responsible for imported emissions, and recommends only that consumption emissions be monitored (page 445).

Second, the CCC never sufficiently considers the causes of greenhouse gas emissions. For example, they never report that it is primarily higher income groups that are responsible for carbon emissions; they never distinguish between high-carbon and low-carbon jobs; and they never really consider financial issues such as the extent of subsidies to fossil-fuel industries.

Third, the cost to the public purse of the BNZ is calculated as only £9-12 billion by 2030, which is less than the £12 billion by 2025 pledged in the government's [ten point plan](#) – which has itself been criticised for being far too little.

To conclude: this plan will not work. And if it did work, the UK would still not be on a pathway to avoiding 1.5 degrees heating. We need a better plan, and we need it now.

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Calculating a fair carbon budget for the UK

This second article by PETER SOMERVILLE provides more detail on how a carbon budget for the UK could be set, and discusses some problems with the Climate Change Committee (CCC)

A global carbon budget is the total amount of carbon dioxide emissions that human activities across the world can be allowed to generate, in order to avoid excessive global warming.

Budgets vary, according to the degrees of temperature increase that are judged to be allowable, and according to how sensitive the climate is judged to be in response to carbon emissions: the greater the sensitivity, the smaller the budget has to be.

Unfortunately, we do not know exactly how sensitive the climate is to carbon emissions, so budgets are calculated across the range of possible sensitivities.

The IPCC [Special Report on Global Warming of 1.5 degrees](#) provided a range of figures for the remaining global carbon budget in 2018 (Table 2.2 on page 108).

On the basis of the median climate sensitivity, the budget to limit warming to 1.5°C above pre-industrial levels was stated as 580 billion tonnes of carbon dioxide (580 GtCO₂). That means the world has a mere 50:50 chance of staying below 1.5°C.

Arguably, however, a higher level of climate sensitivity is required, to give the world at least a 66% chance of reaching the 1.5°C target. At this level, the carbon budget in 2018 was 420 GtCO₂.

All economic and other human activity in the world currently emits approximately 40 GtCO₂ per year, so the remaining budget today in 2021 is closer to 300 GtCO₂. At this rate the budget would be fully spent before 2029.

The task here is then to calculate what might count as a fair share of this budget to be allocated to the UK.

The first problem is that the global budget is for carbon dioxide only: other greenhouse gases (GHGs) such as methane and nitrous oxide are calculated separately.

Methane has minimal long-term effect on the climate, but it is a powerful greenhouse gas in the short-term, which needs to be reduced to zero as soon as possible in order to minimise its contribution to peak warming (see CCC [Sixth Carbon Budget report](#), page 372). Arguably, therefore, a fair carbon budget for the UK should take account of all GHGs.

The CCC appear to agree, as they state: "UK carbon budgets are set on an aggregated all-GHG emissions basis and not using CO₂ (or long-lived GHG) emissions alone" (page 371).

Emissions are published separately for the different GHGs in annual reports by the Department of Business, Energy and Industrial Strategy (BEIS). These are measured in tonnes of carbon dioxide on its own (tCO₂) or in tonnes of carbon dioxide equivalent (tCO_{2e}) to include all GHGs.

In calculating a fair budget for the UK, a number of factors have to be taken into account:

1. *GHG emissions produced within the UK*, i.e. so-called production or territorial emissions, amounting in 2018 to 451 MtCO_{2e} for all GHGs of which 366 Mt were for CO₂ alone. These are the emissions counted in the BEIS annual reports, following the example of the IPCC.
2. *GHG emissions produced outside the UK*, for which the UK has some responsibility, e.g. as consumers or exporters. These emissions are produced either through the manufacture and transport of goods that are imported to the UK, or from goods that have been produced within the UK but exported and consumed outside the UK. In 2017 imported emissions added about half as much again to the UK's emissions total ([Sixth Carbon Budget report](#), page 344), but the figure for exported emissions is unknown. It is important to note that this is essentially a shared responsibility between the UK and the countries with which it trades. The CCC argues that the UK should reduce what it calls its "overseas consumption footprint" by about 90% below 1990 levels by 2050.
3. *The UK's historical contribution to CO₂ emissions*. This [has been estimated](#) at 55 GtCO₂ from 1900 to 2004, which is of course considerable. However, because CO₂ can stay in the atmosphere for centuries, emissions from many years ago still cause global heating. This strengthens the argument not only for reducing the UK's overseas consumption footprint, but also for setting a much tighter budget for its territorial emissions. It is debatable from what point countries should have responsibility for their emissions, but the CCC argues that 1990 is a reasonable start date on the grounds that this is when the world became aware that such emissions are causing global warming.
4. *The UK's capabilities compared to other countries*. There is no general agreement on how such capabilities are to be measured, but the most common measure is in terms of Gross Domestic Product (GDP). [Currently](#), global GDP is \$92 trillion and UK GDP is \$2.8 trillion. The UK has the sixth largest economy in the world and therefore has much greater capabilities than most other countries, which again implies that a

tighter budget is appropriate or, alternatively, much greater assistance to other countries is required in order to reduce global emissions.

5. The potential contribution that the UK can make to the reduction of emissions by the *removal of CO₂* from the atmosphere over and above natural carbon cycles (where carbon is regularly absorbed by oceans, soils and plants, and released later on). Basically, this can be done by natural means (such as restoring peatland, planting trees, and improving soils) or artificially, by so-called negative emissions technologies (NETs). The extent of this potential is unknown.

The next logical step would be to agree on how the global budget should be allocated to individual countries, taking account of the above factors. Unfortunately, however, no such agreement exists.

Under the Paris Agreement, signatories agree to have the “highest possible ambition”, and it is left up to the countries concerned how that is to be interpreted.

The key question here is: how far can this ambition be specified in terms of a carbon budget?

Since 2019 the UK government has been committed to reaching net zero GHGs by 2050 and this is argued to be sufficiently ambitious.

For example, in its [Sixth Carbon Budget report](#) (page 320), the CCC states that 2050 was chosen, rather than the IPCC’s global date of 2070, in order to show the UK’s greater responsibility “as a relatively rich country with a high historical contribution to climate change and high overseas consumption emissions footprint”.

Job done, you might think – until it is pointed out that the CCC’s argument is based on the assumption of a 50%, rather than 66%, chance of limiting global warming to 1.5°C, an assumption that results in a budget of 580 GtCO₂,

rather than 420 GtCO₂. This is reflected in the CCC’s calculation that, according to their balanced net zero scenario, a budget of 580 GtCO₂ from 2018 will require the world to reach net zero in 30 years, while 420 GtCO₂ will mean that net zero has to be achieved in 20 years (that is, by 2038).

There are further problems with the CCC’s budget setting and with its whole “net zero in x years” approach (which, incidentally, has been consistently legally ratified by Parliament and accepted by government).

One problem is that the remaining carbon budget set for the UK from 2018, [estimated by researchers](#) at 9 GtCO₂, is far too loose.

In terms of population size alone, one would expect the budget to amount to around 0.88% of the global budget (with UK population being 67 million and global population 7,900 million); for a global budget of 580 GtCO₂, this results in a UK budget of 5 GtCO₂, significantly lower than 9 GtCO₂.

(For the sake of argument: if the UK were to adopt an arguably Paris-compliant target in line with a 50% chance of 1.7°C instead of 1.5°C, the global budget would be 900 GtCO₂, meaning a UK budget of 8 GtCO₂, which would still be below the budget implied by the CCC’s approach).

So, even on the most generous of interpretations, the UK’s budget is larger than it should be.

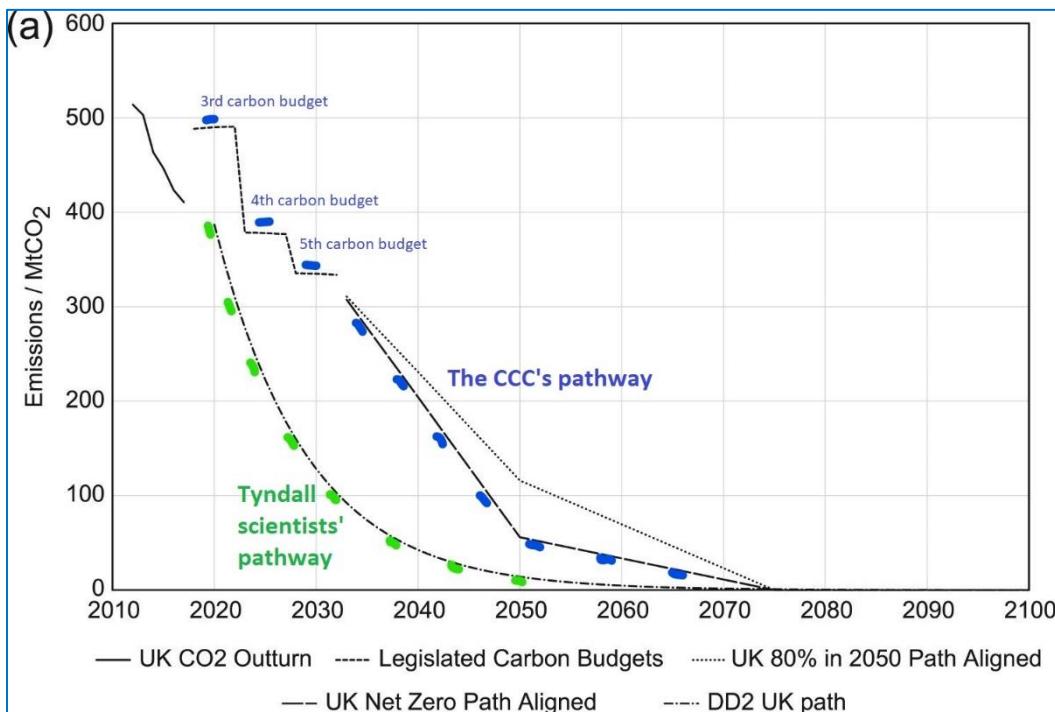
The CCC’s budget is compliant with the Paris Agreement only at the level of a 50% chance of 2°C of warming – and then only if we accept their political assumptions about the UK’s share of the budget, and the way that it ignores the UK’s historical emissions legacy and its current capabilities.

Those capabilities can be measured in different ways. As a crude measure, however, I suggest using the UK’s comparatively high GDP. This amounts to 3% of global

GDP, which is more than three times the global average given the relative size of the UK’s population, from which it follows that the UK should contribute three times as much to reducing emissions as the global average.

The CCC is concerned only to ensure that its proposed pathway to net zero is cost effective, not detrimental to competitiveness, attentive to fuel poverty, fiscally balanced, takes sufficient account of devolved administrations, and so on. It regards UK capabilities for mitigating climate change as limited to spending an equivalent of 1-2% of its GDP.

As for addressing the UK’s “high historical contribution to climate change”, the CCC recommends only climate



This graph is from the [Factor of Two paper](#) by climate scientists at the Tyndall centre. People & Nature added the highlights. The pathway for UK carbon emissions highlighted in green is one that the scientists argue, is compatible with the Paris agreement. The pathway highlighted in blue is one they have plotted to reflect the CCC’s emissions reductions proposals: it implies cutting emissions at about half the pace that the scientists’ pathway implies



financing for developing countries, particularly for low-carbon technology (see [Sixth Carbon Budget report](#), pages 320 and 323).

It is important to note that the CCC's balanced net zero (BNZ) pathway represents the *minimum* ambition to reach net zero by 2050, and I have criticised this lack of ambition – or rather lack of *the right kind* of ambition – in the first article, above. They do present (page 87) a more ambitious alternative pathway – the Tailwinds scenario – which gets to net zero in 2042, but this assumes massive application of carbon capture and storage and is much more expensive than the BNZ pathway.

(Interestingly, a Tailwinds scenario with minimal carbon capture and storage (CCS) “was not costed or explored, and so is not a recommended pathway” (page 90); it would reach net zero by 2042 instead of 2050.)

Perhaps more importantly, the CCC itself shows that its BNZ pathway is inferior to what would be required for 1.5°C on the basis of a number of equity principles, in particular to be consistent with a global target of individual purchasing power of \$20 a day. (See the [Climate Equity Reference Calculator](#) and the [Sixth Carbon Budget report](#), page 324, Figure B7.2).

Moreover, the pathway assumes substantial application of carbon capture and storage technologies after 2030, which are required because the budgets before that are too generous; if the earlier budgets were much tighter, then the reliance on CCS would be correspondingly reduced.

This is an example of what I mean by the wrong kind of ambition.

At the same time, of course, this would mean that the budgets would already be spent. Planting billions of trees would certainly help, but trees take time to grow, and time is running out. The powers that be still do not seem to understand this.

All of this discussion so far is based on the UK’s assumption of only a 50% chance of hitting the global target of 1.5°C.

At current levels of emissions, this global budget will be overspent by 2029, so a global temperature rise of 1.5°C is as likely as not to be made inevitable by then.

However, this does not justify the UK continuing with its current much looser budget. On the contrary, it means that **the UK must adopt a tighter budget** in order to mitigate the damage that this overheating may cause across the world.

More importantly, it means that the UK must take more urgent and drastic action to ensure that it does not itself contribute to this overheating.

Based on relative population size alone, a global budget of 420 GtCO₂ translates into a UK budget of 3.7 GtCO₂, so this represents an upper limit for a fair UK carbon budget.

At current levels of CO₂ emissions alone (366 Mt in 2018), such a budget would be spent by 2028. Interestingly, this is consistent with the global position set out in the IPCC’s 2018 [Special Report on 1.5°](#).

But it is still a long way from representing the highest possible ambition, since it takes no account of factors 2, 3 and 4 above. Taking account of these factors would likely result in a budget of less than zero.

Even so, a 3.7 GtCO₂ budget would be a huge advance in comparison with the current UK budget, and would require radical changes in government policy and intervention.

Taking account of all relevant factors, then, effectively drives a coach and horses through the carbon budgeting process.

Does this matter? We know the main sources of emissions in the UK, we need to reduce those emissions as quickly as possible, and we need clear action plans that will do just that. When one is in an emergency situation, is it really worthwhile spending much time working out how long we have left to address the emergency?

The uncomfortable truth is that the budgeting approach to emissions reduction has tended **to delay action** rather than speed it up – perhaps most notably in the “over-performing” of some of the CCC’s five-yearly budgets.

With *the right kind of ambition*, therefore, the UK can make a fair contribution to limiting global warming to 1.5°C.

■ Peter Somerville is Emeritus Professor of Social Policy at the University of Lincoln. His latest publications include: “A critique of climate change mitigation policy”, *Policy & Politics* (2020) 48, 2: 355-378; [“Revisiting the connections between capital and nature I: the importance of labour”](#), *Capitalism Nature Socialism* (2020); [“Revisiting the connections between capital and nature II: the case of climate change”](#), *Capitalism Nature Socialism* (2020); and [“The continuing failure of UK climate change mitigation policy”](#), *Critical Social Policy*.

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