

Personal Carbon Allowances: Background Paper
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Why do we need this policy?

1. Because there is no carbon budget

As Greta Thunberg said in July 2019, according to the latest IPCC report (she was referring to 2017 reports) there were, as of 1st January 2018 a 'carbon budget' of 420 gigatonnes of CO₂ left to emit if we wanted a 67% chance of avoiding a 1.5C temperature increase. At that point climate scientists were agreed that unacceptable consequences would kick in, and so the international community claimed to be aiming to prevent a higher increase. The world economies had continued to emit 42 gigatonnes a year, so Greta argued that according to that maths there were then 8.5 years' worth of emissions remaining. Also, as she said, no one would put their children and grandchildren on an aircraft if they thought it had just a two-thirds chance of reaching its destination. There was a need to be more ambitious. Two years later emissions have not declined so we might say there are now 6.5 years left to drastically reduce emissions. However, as Greta also pointed out the position taken by the IPCC was regarded as overly optimistic by many climate scientists. The figures took no account of the need of the poorest countries to increase their emissions, nor of the already existing positive feedbacks, for example, the methane gas escaping from the shallow seas bordering the Arctic Ocean, as a result of the melting of the polar ice cap. The IPCC also assumed that it would be possible to remove very large amounts of carbon dioxide later in the century, although we have no technology able to do that at scale, and no way of knowing what the cost would be if it can be done.

2. Because the IPCC/COP process has failed

The process inaugurated by the United Nations has failed. As Antonio Guterres, Secretary-General of the United Nations, said in April 2022 "The jury has reached a verdict. And it is damning. This report of the Intergovernmental Panel on Climate Change is a litany of broken climate promises. It is a file of shame, cataloguing the empty pledges that put us firmly on track towards an unliveable world. We are on a fast track to climate disaster. Major cities under water. Unprecedented heatwaves. Terrifying storms. Widespread water shortages. The extinction of a million species of plants and animals. This is not fiction or exaggeration. It is what science tells us will result from our current energy policies." As he pointed out, "current climate pledges would mean a 14 per cent *increase* in emissions." (My italics) The task set by the IPCC has not been honestly engaged with, as he said "Some Government and business leaders are saying one thing, but doing another. Simply put, they are lying. And the results will be catastrophic. This is a climate emergency." The report states clearly that "The cumulative scientific evidence is unequivocal: Climate change is a threat to human well-being and planetary health. Any further delay in concerted global action on adaptation and mitigation will miss a brief and rapidly closing window of opportunity to secure a livable and sustainable future for all."

The report of the Climate Emergency Working Group, Flint et al (2019) provides an excellent discussion of questions relating to the idea of a carbon budget as a way to conceptualise possible routes towards achieving net zero. It addresses the challenges to be faced in achieving net zero by 2030 *if we had started then*. We face the difficulty that as time goes by there will be less and less time available to change the economy to achieve this target. The most recent version of the report also contains information that challenges the meaningfulness of the idea of a carbon budget. It saw good reasons to regard the IPCC's proposition as over optimistic and so supported the target of achieving net zero by 2030. The report rejected the idea that plans could be based on probabilities of success as low as 66% or 50%. It argued that ethically we should seek a higher probability of success than that the IPCC presented, and to do that requires more rapid reductions in emissions. In a subsequent version of the report, Flint et al (2020) notes "There are many uncertainties in the IPCC calculations. Choosing the least favourable (but still plausible) values for some key parameters would reduce the carbon budget:

- A different choice of how we measure the average temperature (on the surface or in the air) reduces this budget to 420 GtCO₂
- A larger value for the climate response to atmospheric CO₂ could reduce the budget to 20 GtCO₂
- A different choice of the pre-industrial baseline (from which we measure the 1.5C rise) which could reduce the budget to minus 230 GtCO₂
- The budget could be further reduced over the course of the century due to permafrost thawing, to minus 330 GtCO₂
- An unexpected increase in non-CO₂ emissions (e.g. methane) could reduce the budget by a further 250 GtCO₂ to minus 580GtCO₂"

In other words, taking the IPCC calculations as a starting point, different assumptions indicate that we were already, in 2019, at the point of needing to remove 580 GtCO_{2e}, and end emissions entirely, at once, in order to avoid a 1.5C heating of the planet with unforeseeable consequences. Of course that cannot be done. *To all intents and purposes then there is no carbon budget.*

Tipping points

As the working group noted there are many signs that the situation is worse than that described by the IPCC. To quote over 11,000 climate scientists, Ripple et al (2019) "The climate crisis has arrived and is accelerating faster than most scientists expected It is more severe than anticipated, threatening natural ecosystems and the fate of humanity (IPCC 2019). Especially worrisome are potential irreversible climate tipping points and nature's reinforcing feedbacks (atmospheric, marine, and terrestrial) that could lead to a catastrophic "hothouse Earth," well beyond the control of humans (Steffen et al. 2018)".

Evidence of this continues to accumulate. For example, there is no doubt that the loss of summer sea ice in the Arctic is already causing the release of methane from frozen methane clathrates in the shallow seas adjoining Siberia, Shakhova

et al (2019). The defrosting of the tundra is leading to the thawing of soils containing large amounts of organic material, and this will release carbon dioxide when it exists in aerobic conditions, and methane when it is in anaerobic conditions. Permafrost that was expected to defrost, according to the IPCC models, in 2090, was found to have defrosted in 2019, Farquharson et al (2019). The Amazon and other tropical forests are losing their capacity to absorb carbon, Pearce (2020). *The process is going into reverse* and a substantial part of the Amazon Rain forest now emits carbon. Tropical wetlands are producing increasing amounts of methane as temperatures increase. The proportion of methane in the atmosphere is increasing faster than the proportion of CO₂, and the small amount of methane in the atmosphere now accounts for 25% of climate forcing, that is to say heating.

In other words there is evidence that changes are accelerating. Tipping points are being passed. The Climate Change Advisory Group (2021) noted that "the Arctic holds vast quantities of stored methane that is locked within permafrost, frozen soils, and beneath the sea floor of the Arctic Ocean. Rapid warming of the Arctic is causing permafrost to warm and destabilise. The increasing carbon dioxide and methane emissions from Arctic permafrost have resulted from it flipping from a carbon sink to a source. In 2019, the Arctic is estimated to have contributed roughly the equivalent of 6.3% of that year's anthropogenic CO₂ emissions. Permafrost thaw has also released unspecified quantities of CH₄ which, on a molecular basis, is 140 times as powerful a warming influence as CO₂, and nitrous oxide, which is roughly 300 times more powerful per molecule a warming agent as CO₂ on a 20-year basis. It has recently been estimated that around 12 times more nitrous oxide is being released from permafrost than previously thought." Changes in the Arctic have destabilised the Polar Jet Stream, allowing very cold air to move south, causing extreme weather events, and allowing warm air to move north, provoking further ice melt and accelerating the melting of the Greenland Ice Sheet. These are all indications that secondary effects of anthropogenic emissions are now kicking in, effects we cannot expect to be able to control.

Evidently there is now an immediate crisis that has to be faced. As professor Sir David King said a year ago "What we do over the next three or four years, I believe, is going to determine the future of humanity". It is clear that the crisis is now and every country in the world needs to make the maximum possible emissions reductions now, and to work towards increasing reductions in every sector year on year after that, before going on to achieve a carbon negative economy.

This should not surprise us. As long ago as 2008 Hansen et al said "If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO₂ *will need to be reduced from its current 385 ppm to at most 350 ppm*", (my emphasis). Today the level is 421ppm (according to Daily CO₂) and rising. Hansen et al argued that humanity faces the danger that a point would be reached when positive feedbacks would be triggered and continuing

global heating is no longer under our control. It seems clear this is now happening.

Why does the IPCC/COP Process continue to fail?

The IPCC failed to predict the speed at which global heating would progress and give rise to positive feedbacks. This reflects failures in the scientific approach taken by the panel, and the political process in which important aspects of IPCC reports had to be signed off by the UN's member state governments.

Unfortunately one of the areas in which the IPCC seems to have had a particular blind-spot is the Arctic. Discussing this Wadhams (2016) noted that the 2013 Fifth Assessment Report of the IPCC AR5 Summary for policymakers, gave a *false account* of Arctic Ocean ice loss. It presented information about ice loss during the period 1950 to 2005 as empirical data when it was in fact projected from modelling. The actual empirical data was available and showed a more serious rate of loss. It then presented data that was modelled from 2005 to 2100, proposing different scenarios assuming different levels of greenhouse gases in the atmosphere. Yet the data for the period 2005 to 2012 was available, and showed a more serious rate of ice loss than the modelling. The data should have been used to inform the modelling of the future more accurately. This may help to explain why the defrosting of the Arctic Ocean and the tundra, with its resulting positive feedbacks, is occurring now much earlier than the IPCC predicted. Wadhams went on to argue that such scenarios as RCP 2.6 (controlling emissions so effectively that anthropogenic radiative forcing, would be limited to 2.6 watts per square metre) were presented at a time when this was no longer feasible. According to Wadhams the IPCC report noted the possibility that methane and other greenhouse gases would be released as the arctic warmed, but failed to pursue the implications for the climate. Today the IPCC continues to assert that positive feedback in the climate system can be prevented if we do not reach an overall global temperature increase of 1.5C at a time when empirical evidence makes it clear these have already kicked in.

In the 1980's some politicians, including, for example Margaret Thatcher, were open to thinking about the dangers presented by climate change. However, the situation changed rapidly. As is by now notorious, the fossil fuel industries mobilised public relations agencies and so called 'think tanks' to present arguments denying or spreading doubt about climate science. The arguments, even the agencies themselves, were those that had been used to suppress action against tobacco companies in the light of findings about health effects. They put pressure on politicians, and shaped their financial sponsorship of them, to weaken government's responses to the climate crisis. Examples include attempts by the US government to silence James Hansen, and the removal of Robert Watson as Chair of the IPCC at the instigation of ExxonMobil. He had been proposing that global warming was progressing a third faster than previously thought. Campaigns of harassment and deliberate disinformation led to a situation in which climate scientists themselves practised self-censorship of their results. Organisations such as the Heartland Institute, in the US, and Net Zero Watch, aka The Global Warming Foundation/Forum in the UK, as well as many

others produced and promoted such material and it was reproduced mainly in the right-wing press (Carter and Woodworth 2018).

In summary then, there were some scientific failures and there have been some scientific surprises. The climate system proves to be more dynamic and unstable than most scientists expected 40 years ago. However, the failures of the IPCC/COP process can be seen as driven by commercial interests deliberately promoting disinformation and buying political influence, with the help of elements of the media. We should not assume that there is a 'safe' level of carbon emissions, but we cannot just stop emissions overnight. Survival depends on continuing to produce food and many other goods and services, although these can be decarbonised in time. However, it is possible to make initial substantial reduction to slow the development of the crisis, to try to buy time to decarbonise the economy, and release resources needed by developing countries that have contributed least to the cause of the crisis. Hoesung Lee, Chair of the IPCC, has repeatedly urged governments to do this, most recently at COP 26, in 2021.

Climate Justice

Because of the failure to act people in developed countries continue to enjoy a high carbon lifestyle while the crisis that threatens everyone develops and no effective action is taken. A succession of reports has shown that people have been dying as a result of the changes in climate that have already taken place. According to the World Health Organisation (2002) climate change was already estimated to cause over 150,000 deaths annually. It published a map showing the distribution of climate change related deaths in the year 2000. These were mostly occurring in the 'global south'. Clearly people have been dying as a result of climate change for at least 20 years. In 2018 the World Health Organisation predicted that excess annual deaths attributable to climate change would increase to at least 250,000 per year during the period 2030-2050. Many of the most vulnerable populations are to be found in the global south. Everywhere in the world the poorest people are least able to adapt to the changing climate. They are the people who have made the smallest contribution to the development of the problem.

The Climate Crisis and Racism

Governments and elites continue to fail to take action. Since people of colour are disproportionately represented among the immediate victims of the climate emergency it is hard to avoid the conclusion that this failure is at least in part driven by racism. It also true that we know that people are generally more willing to make sacrifices, for example by consuming less or paying higher taxes, when they see that as being done to help people like themselves. This tendency is thought to have contributed to the decline of social democracy in European countries as the populations of those countries have become more ethnically and culturally diverse. Green parties should be in the forefront, rebuilding social solidarity and arguing for policies that level the playing field in relation to levels of consumption and access to resources. This proposal, designed to reduce our demand on resources and reduce our carbon footprint quickly, and fairly, is one

aspect of that approach. No longer will mostly white, privileged people choose to recklessly consume high carbon goods heedless of the consequences for others. Instead, they will have been persuaded to accept a system of fair shares for all, and a rapid reduction in the consumption of climate destroying commodities. Such sacrifices will be seen as acceptable, because everybody has to make them.

Faced with the failure to achieve international solidarity a few small countries have attempted to get to zero carbon emissions, but no major economy has attempted this. The world needs countries with major economies to take the lead in rapidly reducing emissions, and adopting policies to draw down carbon. This is what the Green Party should ask the society of the UK to do. In addition, just as we have argued for making emission cuts in advance of those the IPCC then called for, now, facing the failure of the IPCC process, we should argue that the UK has a duty to take the lead in showing that policies that genuinely aim to tackle the crisis can be achieved and maintained in a free society.

Green Party discussions of mechanisms to reduce consumption to date

Up to now the work of the Climate and Ecological Emergency Working Group has been guided by the IPCC reports. We have tried to make the Green Party's policies more radical than those required by the IPCC, but nevertheless have looked towards an orderly and gradual transition in which each sector would make cuts driven, in the main, by carbon taxation, with the possibility of some further regulation and even possibly rationing.

Green Party policy on the climate emergency has been focused on the use of carbon taxation and dividend to shape less carbon intensive production and consumption. The idea of rationing has been discussed and rejected. Although, as Flint et al noted, "The simplest and most certain way to share a scarce commodity such as the right to emit greenhouse gases is to allocate every resident a quota which would be reduced each year. In the case of emissions this would be complex, hugely disruptive and, we believe, widely resented, could not be made to work without considerable enforcement and that would only be possible if the majority of people saw the need."

Flint et al noted that "The WG considers that emissions rationing may be needed in the future if other means fail but rejects it for the foreseeable future" and that "Conference inserted the word carbon before rationing in order to suggest that any proposal would be quite different from the rationing used during World War 2. However, this insertion may not have the intended effect. Every product and service has embedded carbon so carbon rationing would affect every product and service. WW2 rationing, by contrast, affected only some" Flint et al p55."

For those reasons the Green Party rejected rationing and instead relies on carbon taxes. These would be used to discourage consumption of goods that have high 'costs' in Greenhouse Gas Emissions (GHGs). However, because a carbon tax alone would increase the cost of living it would be likely to impose a disproportionate burden on the poorest members of society. Therefore, the Green Party proposes a system of carbon taxation *and dividend*. A substantial

part of the tax take would be re-distributed to the population on a per capita basis. Since the rich consume more than the poor this would be a re-distributive tax.

However, the sole use of carbon taxes to reduce consumption has disadvantages. The Climate Change Advisory Group (2021a) noted "carbon prices are unlikely to be sufficient by themselves to reduce emissions at the pace needed." They may not be effective enough, and they may not be experienced as fair. Despite the use of the dividend wealthier people would still be able to consume more. Personal Carbon Allowances should be reconsidered as an alternative approach to reducing GHGs, at least in some sectors of the economy. This would not exclude the use of carbon taxes, or the use of progressive income and wealth taxes to level the playing field when it comes shaping production and reducing inequality.

Policy Options

Why target aviation, road fuels, and meat and dairy foods?

The Climate Policy Working Group Background Paper Flint et al 2019 provides a comprehensive review of the UK's greenhouse gas emissions and of our policies aimed at phasing these out by 2030. The group also acknowledges the need to reduce emissions as soon as possible. Evidently there are some areas, such as domestic heating, where it will be difficult to make changes in a very short time. In other areas, such as forestry and land management, it may be possible to make the sectors carbon negative in time, but this will require very substantial changes in existing government policies in order to make changes that will take years to take effect. For example, re-forestation may take as long as 50 years to capture significant amounts of carbon, and the trees must survive the dangers of disease, drought, and changes in policy if they are to store carbon long term. However, in some areas progress could be made quite rapidly if government had the will to do so. Such areas are the use of private fossil fuel powered cars, leisure flying, and the consumption of meat and dairy foods.

Specific targets

The proposal is that there should be a number of specific Personal Carbon Allowances aimed at specific areas of consumption. To reduce the administrative burden these might be rolled out one by one. Three obvious areas in which rapid progress with reductions could be made are road fuels, aviation, and the consumption of meat and dairy products.

Road fuels and car use

Fossil fuel powered cars are thought to give rise to 70Megatons of Carbon Dioxide equivalent (MtonsCO_{2e}) emissions in the UK (BEIS 2020), amounting to 13-14% of total greenhouse gas emissions from the UK, as well as much local air pollution. The aim of the policy is to provide a mechanism for phasing this out rapidly. The policy should be understood in conjunction with those aspects of the current Transport Policy Chapter in Policies for a Sustainable Society that focus

on both reducing the need to travel, and providing more sustainable means of doing so.

Today the infrastructure of work, education and distribution has been completely re-organised around the private car. Therefore, to reduce emissions arising from private cars the existing policies on modal shift, and on public transport, have to be pursued energetically, alongside efforts to reduce car use and the carbon emissions that arise from that use. In reducing access to petrol and diesel occupations would need to be taken into account, and so would needs arising from remoteness etc. Given the history of resistance to reducing fuel use, we should be aware by now that this will not be accepted unless it is accompanied by other policies, most importantly the provision of subsidised, or even free, public transport.

It is possible to *imagine* maintaining the existing pattern of travelling with a shift to electric car use. However, to replace the 30 million or so private vehicles in the UK with electric vehicles would be an enormously carbon intensive project in itself. Also, until our electricity supply is completely decarbonised, adding electric vehicles is not carbon neutral. It is already Green Party policy to aim to reduce the amount that people travel in their everyday lives, and to reduce the proportion of journeys made by car. This could be achieved more quickly if there was downward pressure on car use achieved by providing a diminishing personal carbon allowance, limiting the availability of petrol and diesel fuels.

As an interim measure we should allot individuals a Person Carbon Allowance of petrol and diesel for use in private cars with a view to phasing out those fuels between now and 2030. In 2020 the Autumn Conference adopted a policy to remove such vehicles from the roads in 2030. Hence, this policy can be seen as an additional policy to achieve that goal, and one that would still be relevant in the (likely) event that the GP has not been in a position to enact its policy by 2030.

Aviation

Eighty-five per cent of UK flying is for leisure purposes. Estimates of the sectors contribution to UK GHG emissions vary, depending on the assumptions made. It may account for 12% of UK CO₂ emissions (Bows and Anderson, Tyndall Centre, 2006). They say “The scale of anticipated aviation emissions is such that this single sector will consume around one third of the UK’s Paris-compliant carbon budget.” Melia (2020) argued that the CO₂ effects of UK aviation currently amount to 8% of the UK’s total, but that depending on the assumptions which are made, a multiplier, taking account of non-CO₂ affects, may be anywhere between 1.0 (no difference) and 4.0 (four times greater). The Institute of Technology and Engineering (2021) argues that aviation accounts for 23% of UK CO₂e emissions. There is no technological fix for flying and none is expected even by 2050, as the engineering report to Parliamentary Climate Change Committee, Allwood et al (2019), noted. On the face of it civil aviation should simply stop. There would need to be a debate about humanitarian flying, and the needs of geographically

divided families, but really these account for a very small proportion of total flights.

The goal would be to eliminate flying for leisure purposes, with possibly some variation for people with family members in other countries. Hence for most people there would be no “ration”. In the event that genuinely sustainable aviation fuel becomes available in future this policy would be reviewed.

Meat and dairy foods

Allwood et al (2019) argued that there would be a need to entirely eliminate beef, lamb and dairy foods after 2030 in order to achieve the UK government goal to reduce UK carbon emissions by 68% from 2018 to 2035. By contrast the Green Party working groups on climate change and on food and agriculture envisage a much-reduced dairy industry after 2030, and this would produce a limited amount of beef as this is an inevitable by-product of the dairy industry. Our policies envisage less substantial, but still significant reductions in the production of other meats and of eggs. Since we assume that the UK has to take responsibility for the emissions arising from imported goods we can assume, for the sake of this discussion, that there is no such trade in these foodstuffs, or that imports exactly cancel out exports.

As is well known eating meat and consuming dairy products makes a disproportionate contribution to GHG emissions. The CEWG noted that food and agriculture production in the UK produced 47MtonsCO₂e, and imports of food and fodder accounted for a further 28MtonsCO₂e, in 2016. The goal must be to drastically reduce this total. Feeding crops to animals to produce meat and dairy foods is very inefficient as a way of providing food for human populations. However, not all aspects of animal husbandry are equally inefficient in these respects. Cattle raised for beef, and sheep, have the highest GHG footprint, while the production of pork, poultry and eggs have lower footprints. A system of Personal Carbon Allowances should take these different factors into account. It would do so by allotting points to different products in such a way that those choosing to consume beef would be using up a disproportionate amount of their ration. Other foods would not need to be limited in this way. It is likely that the party would also wish to take account of animal welfare issues. For example, eggs may be the best source of animal protein vis a vis GHG emissions, but this might not hold true if animal welfare was improved.

This policy is consistent with that proposed by the Land Use Working Group. It would reduce the greenhouse gases produced by our agriculture and food sector. In addition it would free up land currently used for pasture. Some land in the UK used for pasture or fodder for the production of meat and dairy products could produce other foods for human consumption, and some managed for forestry or for carbon capture, as policies under discussion envisage.

Other high carbon areas of production and consumption such as the steel, cement and construction sectors are not addressed by these policies, although

direct government intervention might prove necessary if taxation and regulation fail to achieve the necessary carbon reductions.

The politics of Personal Carbon Allowances

There are two goals. The first is to bring about rapid reductions in greenhouse gas emissions in a fair way. The second is political. It is to “Tell the Truth”, to adopt a policy that highlights the real and immediate danger that humanity faces by insisting on the need for these policies despite the fact that they will not be comfortable for many people.

Government action to reduce consumption is always likely to be unpopular if the population is not persuaded of the necessity. The Working Group noted research on public attitudes that found that “The greater the mitigation potential of an action the less willing are households to implement it, especially with regard to travel. *The measures that people said they would adopt voluntarily reduced their emissions by 26-30%*” (my emphasis). The policy might be unpopular, but research (Dubois et al 2019) indicates that while people are reluctant to change their behaviour in regard to how they travel, “*many people would be willing to accept changes in their travel options if they applied to everyone*”. That is what the introduction of Personal Carbon Allowances would achieve.

Implementation

Personal Carbon Allowances can be administered by the use of cards, like bank cards and store cards that are used to authorise transactions. They might also be administered by the use of phone apps. The technology exists. If we have the courage to do this, it can be done.

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