Justice and the distribution of greenhouse gas emissions

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The prospect of dangerous climate change requires Humanity to limit the emission of greenhouse gases. This in turn raises the question of how the permission to emit greenhouse gases should be distributed and among whom. In this article the author criticises three principles of distributive justice that have often been advanced in this context. He also argues that the predominantly statist way in which the question is framed occludes some morally relevant considerations. The latter part of the article turns from critique and advances a new way of addressing the problem. In particular, first, it proposes four key theses that should guide our normative analysis; and, second, it outlines how these four theses can be realised in practice.

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Introduction

The scientific consensus is very clear that the continued emissions of high levels of greenhouse gases are causing fundamental changes to the earth’s climate. These will lead to severe threats to fundamental human rights – including the human right to life, the human right to health, and the human right to subsistence (see Caney 2009c,d). There is, therefore, a moral imperative to prevent dangerous climate change from occurring. This, in turn, requires limiting the emission of greenhouse gases. Given that there must be a limit on the total volume of greenhouse gases emitted there is a paramount need to arrive at a fair way of distributing the right to emit greenhouse gases.

The importance of arriving at an equitable solution is recognised by the United Nations Framework Convention on Climate Change (UNFCCC 1992). As Article 3.1 states:

The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof. (UNFCCC, Article 3.1; emphasis added)

What, then, would be a fair way of distributing rights to emit greenhouse gases? I shall break this question down into two further questions – namely:

1. What distributive principle should govern the distribution of the right to emit greenhouse gases? What is or are the fairest distributive criterion or criteria? Should it or they be equality or sufficiency or something else? (Q1)
2. Which entities should possess emission rights? Who is entitled to possess rights to emit greenhouse gases? Should they be states or firms or individuals or some other entity? (Q2)

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These two questions do not, of course, exhaust the questions of justice that we face. Other important questions include:

(3) May emission rights be permissibly traded? (Q3)
(4) Is it permissible for some to receive additional emission rights through flexibility mechanisms such as the Clean Development Mechanism and Joint Implementation? (Q4)
(5) What would be a just procedure for deciding how greenhouse gas emissions should be distributed? (Q5)

In what follows I shall concentrate on Q1 and Q2 (though what I say will have implications for Q3 and Q4).

Background

Prior to beginning the analysis, it is worth making three preliminary points. First, it is helpful to provide an empirical background. Three salient facts should be borne in mind. The first concerns the historical record. The Pew Center on Global Climate Change reports that ‘[f]rom 1850 to 2000, the United States and the European Union were responsible for about 60% of energy-related CO2 emissions, while China contributed 7% and India 2%’. Furthermore, according to a recent report by Michael Raupach and his co-authors published in 2007, ‘[t]ogether, the developing and least-developed economies (forming 80% of the world’s population) accounted for ... only 23% of global cumulative emissions since the mid-18th century’ (Raupach et al. 2007, 10288). The second point concerns the current distribution of emissions. The Netherlands Environmental Assessment Agency (2008) reports that in 2007, the USA’s per capita emissions were 19.4 metric ton CO2, Russia’s were 11.8, and the EU-15’s were 8.6. China, which now emits 24% of global CO2 emissions, emits only 5.1 metric ton CO2 per person, and India’s figure is 1.8. Developing countries thus have low per capita emissions. It is with these first two points in mind that we should draw attention to a third point – namely, that the greatest increases in greenhouse emissions are now coming from developing countries. Raupach and his authors report, for example, that ‘the developing and least-developed economies ... accounted for 73% of global emissions growth in 2004’ (Raupach et al. 2007, 10288). The Netherlands Environmental Assessment Agency (2008) further reports that ‘[i]n 2007, global CO2 emissions increased by 3.1%, compared to 3.5% in 2006. China’s emissions accounted for two thirds of this increase.’ As stressed above, it is crucial that this point not be taken in isolation. China’s cumulative and current per capita emissions are still a fraction of the cumulative and per capita emissions of North Americans and Europeans. Nonetheless, it is relevant for when we think of future emissions policies.

A second point: it is very important to put the question of the fair distribution of emissions into context. The prospect of dangerous climate change generates a number of different imperatives. First, there are a variety of different mitigation responsibilities. It is essential that there is (1) a reduction in the emission of greenhouse gases, (2) the creation and maintenance of carbon sinks, and (3) increased use of alternative energy sources and the creation and transfer of clean technology. Second, in addition to these mitigation responsibilities, there are also adaptation responsibilities. That is, there is a need to enable those who will be threatened by dangerous climate change to cope with the changes to which we are already committed. It bears noting here that mitigation and adaptation may not be sufficient. This entails that there is a third set of responsibilities – compensation responsibilities – that is, the responsibility to aid those whose rights have been violated by dangerous climate change. The full set of responsibilities is set out in Table 1.8
Now the point here is that a fair share of emissions should be seen in the context of a fair share overall. What matters is that the relevant actors bear their fair share of the total burden. Given this, it is misplaced to focus simply on an actor’s emission rights in isolation from their other responsibilities. This is an important methodological point to which I will return later.

Finally, it is worth underscoring the importance of devising a fair distribution of the burdens of combating climate change. The necessity of preventing dangerous climate change is widely recognised. This view is, rightly, motivated by a concern for the potential victims of climate change. As such, it is concerned with what one might term entitlement-bearer justice; that is, its focus is on people’s rights that are jeopardised by climate change. It is, however, also crucial to distribute the responsibilities to combat climate change fairly. This point is frequently overlooked. Many interesting and important policy proposals focus exclusively on the entitlement-bearer’s concerns and do not explore the question of whether the sacrifices involved are distributed in a fair way. This, however, is of fundamental importance. A policy that averted dangerous climate change would nonetheless be unfair if the duties to mitigate and adapt were unfairly distributed. It is not enough to devise efficient policy proposals, for they might be thoroughly unjust in their distribution of costs. We might term this second value ‘duty-bearer justice’. This article is an attempt to make a contribution to the issues of duty-bearer justice: how should emissions be distributed?

**Distributive criterion 1: grandfathering**

Let us now consider various possible criteria for distributing emissions. I shall examine four different proposals. The distributive criterion that is most often applied in practice is ‘grandfathering’. This has two features. It stipulates, first, that the fair share of emissions for any actor should be a function of its past share of emissions, and, second, that these emission rights should be handed out free of charge to these actors. As such, it is a particular kind of historical principle. The EU Emissions Trading Scheme (EU ETS) that came into effect on
1 January 2005 initially distributed emissions according to a grandfathering rule (though it is now moving towards an auction-based scheme). A partial commitment to grandfathering can also be found in the Kyoto Protocol. By requiring Annex I countries to make cuts with respect to 1990 levels, it takes the latter as an appropriate benchmark for the distribution of emissions (among industrialised countries). (Of course, its treatment of developing countries does not have a grandfathering component.) A commitment to grandfathering is also presupposed in any argument to the effect that everyone should make proportionate cuts in their greenhouse gas emissions. The latter assumes that the existing share of emissions is just but that the total level is too high and so cuts should be made that preserve the initial distribution of emissions.

No moral and political philosopher (to my knowledge) defends grandfathering, presumably assuming that it is unjust. Given, however, that negotiators for major emitters routinely invoke it and that it is also generally embodied in environmental policy making, it is worth discussing it, if only briefly. It is vulnerable to two serious objections. First, it is insensitive to people’s needs and would lock members of developing countries into a permanent state of poverty and underdevelopment. Any adequate principle governing the emission of greenhouse gas emissions should take into account other ethical concerns and fundamental human rights. And it is implausible to deny that eradicating great poverty is an ethical concern of paramount importance. Persons have human rights to meet their most basic needs. At the moment, though, many lack those most fundamental human rights. The United Nations Development Programme reports, for example, that currently 20% of the world’s population live on less than $1 per day and a further 1.5 billion people survive on $1–$2 per day; in addition to this, a third of preschool children and 850 million people in total suffer from malnutrition (UNDP 2005, 24). Many also lack adequate access to energy. Consider the situation faced by China and India – both countries which would be allocated low emissions on any per capita grandfathering rule. Shonali Pachauri and Leiwien Jiang report that ‘[o]f the world’s estimated 1.6 billion people without access to electricity . . ., over a billion reside in these two countries [China and India], most of them in India’ (Pachauri and Jiang 2008, 4022). They add that ‘in India only about half of the rural population has access to electricity and close to 10% of the urban population also still lacks access’ (Pachauri and Jiang 2008, 4033). Grandfathering would entail that both China and India receive radically fewer emission rights per capita than North American, Japanese and European citizens, and as such would thwart the former’s legitimate interests in development and the realisation of fundamental human rights to meet basic needs.

Second, grandfathering runs contrary to another deeply held principle of justice – namely, the principle of historical responsibility. It is widely held that those responsible for creating an environmental problem should bear a commensurate cost. If, for example, some release toxic waste into a river or create a mess in the street we expect them to make good the harms they have created. Grandfathering, however, violates this deeply entrenched principle. It does not make those who cause a problem bear a corresponding burden. In fact, it remunerates people for behaviour that has caused the problem. For these reasons, we should conclude that grandfathering represents a profoundly unfair way of distributing emission rights.

Note, though, that to affirm that grandfathering is an unfair principle for the distribution of greenhouse gas emissions does not, of necessity, entail that policymakers motivated by a commitment to justice should reject a scheme that employs grandfathering. For that we need further argumentation. Consider two pragmatic justifications of grandfathering:

1) The longhaul argument: this holds that it is necessary to include grandfathering at the start of a scheme designed to lower total emissions because the scheme can then be reformed over time to produce a more equitable distribution of emissions. On this
grandfathering is a necessary first step in order to move, after time, to a fairer distribution.

(2) The priority argument. This holds that humanity’s most urgent priority is to avert dangerous climate change. It reasons that major emitters need to be involved in a programme of mitigation for it to succeed and that the major emitters will refuse to engage in any mitigation without grandfathering. Thus, it argues, we should accede to the demands of major emitters in order to secure people’s entitlement to be protected from the threats posed by climate change.

One could endorse either of these arguments and still hold that the distribution of emission rights according to grandfathering is an unfair way of distributing such rights. A proponent of the first argument can accept that it is unfair but argue that it is a necessary price for attaining a fairer distribution in the end. A proponent of the second argument can also accept that it is unfair but argue that this is an acceptable price to pay because the goal of preventing dangerous climate change is more important. It does not deny (or affirm) that grandfathering is distributively unfair: it contends that in this case entitlement-bearer justice should take priority over duty-bearer justice.

To put the point another way round, it would be a category mistake to think that either of these pragmatic arguments could show that grandfathering is a fair distributive principle. The first argument concedes that it is not just because it endorses as a long-term goal an alternative putatively fairer distributive principle. It is thus predicated on the assumption that grandfathering is in fact unjust and should be rejected in the long term. And the second argument simply downplays the relevance of the issue of the fair distribution of greenhouse gases.

With these points duly noted, it is nonetheless worth adding that it would be inappropriate to endorse either pragmatic argument as they stand without any further comment. In the case of the longhaul argument, one would want to add that though a policymaker who endorsed this argument might be acting justly, the high emitters who insist that a mitigation programme must adopt a grandfathering principle before they will comply with it are acting unjustly.7 Others can say, ‘You/we had better give them (the major emitters) grandfathered rights because otherwise they will not join up and then there will be no prospect for arriving at an equitable emissions agreement. So, in the name of achieving justice, you/we had better agree to their requests.’ However, those with high emissions cannot themselves employ the longhaul argument to argue that grandfathering is required by a commitment to justice. They cannot say that without granting grandfathered rights to major emitters it would not be possible to arrive at the fair outcome because they themselves could, by lowering their own emissions, arrive at the antecedently defined fair outcome. All they can say is, ‘Give us the grandfathered rights otherwise we will not move towards a fair distribution (even though we could do so now),’ and if that is the only reason they can give in defence of a scheme that grants them grandfathered rights, then they are evidently acting unjustly.8

Consider now the priority argument. The weak point in this argument is the assumption that preventing climate change should necessarily take priority over any possible distribution of the burdens involved in combating climate change. Suppose that one could avert dangerous climate change but only through systematic and extensive violation of human rights. There is a point at which the injustice involved in the distribution of burdens may be so great that it trumps the fact that the policy in question prevents dangerous climate change. The cure may be worse than the disease. This is not to deny that one may have to make some trade-offs between entitlement-bearer justice and duty-bearer justice. However, to do this one needs to have some idea of the fair share of those burdens (including the fair share of greenhouse gases). It is only with this in mind that one could gauge whether any proposed compromise represents an ‘acceptably’
unjust as opposed to an ‘unacceptably’ unjust price to pay.\(^9\) The question as to what is a fair
distribution of emission rights thus remains pertinent.

**Distributive criterion 2: equality**

Let us turn now to consider a second view. Many propose an egalitarian approach to greenhouse
gas emissions (and in particular to carbon emissions). They hold that all persons have a right to emit an equal amount of greenhouse gases. This idea was given powerful expression by Anil Agarwal and Sunita Narain in their seminal ‘Global Warming in an Unequal World’. They write that the earth’s ability to absorb greenhouse gases is a ‘global common’ and they maintain that ‘this vital global common should be shared equally on a per capita basis’ (Agarwal and Narain 1991, 13). The egalitarian principle is also defended by Dale Jamieson, who writes:

In my opinion the most plausible distributive principle is one that simply asserts that every person has a right to the same level of GHG emissions as every other person. It is hard to see why being American or Australian gives someone a right to more emissions, or why being Brazilian or Chinese gives someone less of a right. (Jamieson 2005, 231)\(^{10}\)

A variant of the equal per capita principle is also affirmed in the proposal known as ‘contraction and convergence’ (see Meyer 2000).\(^{11}\) This idea, which was developed by the Global Commons Institute, allows industrialised countries gradually to reduce their emissions and for developing countries gradually to increase their emissions until, after a transition period, everyone has the same emission rights as others. So although it seeks to realise a state of affairs in which everyone has the same emission rights, it proposes a transition period in which industrialised countries have a marked more-than-equal quota of emissions.

The ‘equal per capita’ view has considerable intuitive appeal. The global atmosphere is plausibly seen as a global public good and one might at first glance think that, as such, use of it should be shared out equally between all of humanity. This view is, however, vulnerable to a number of objections.

First, one puzzling aspect of this approach is that it fixes on one good (the ability to emit greenhouse gases) and treats it in isolation from people’s access to all other goods. But why should we treat this one good separately from all other goods? Why not consider someone’s entitlements as a whole, taking into account their access to all the relevant ‘primary goods’ (Rawls) or ‘resources’ (Dworkin)?\(^{12}\) In other words, why should this one particular good (emitting carbon dioxide) have its own principle regulating it? Why single this out for special (equal) treatment? Why not put it into the general pot of all goods to be distributed and then have a distributive rule applying to the whole package of goods contained therein?\(^{13}\) It is true that there are some goods (for example, voting rights) which we do think should be treated in isolation from the distribution of other goods, and which do have their own distributive rule. But this is because those goods have a special social significance (it would, for example, be humiliating to allocate some unequal civil liberties even if those with the lesser civil liberties were given some extra money instead), and the distribution of emission rights does not have this kind of social significance.

A second problem with the equal per capita approach follows from a point made by Amartya Sen. Sen has long argued that it is wrong for theories of distributive justice to focus on ‘resources’ or Rawlsian ‘primary goods’. Sen’s claim is that this is a kind of ‘fetishism’, for it wrongly focuses its attention on what has value only as a means to an end (Sen 1997, 366). The same can be said of focusing on emission rights. For the latter have value only as means to an end – what matters is people’s ability to pursue various goals and to enjoy certain ‘capabilities’. Emissions have value only insofar as they serve these goals. It is therefore implausible to focus on distributing one particular resource equally if doing so will leave people unequal in their ability to pursue various goals.
The importance of this argument to the issue at hand is apparent when we consider the fact that people have different needs. Some have a greater need of emissions because they are more physically frail or sick. Others have a need for greater emissions than others because they live in a cold and inhospitable climate. A regime of equal emissions is thus unfair on those with unequal needs.\(^{14}\)

Third, a further, and related, flaw in the equal per capita view is that it ignores the fact that people have differential access to acceptable non-fossil-fuel energy sources. The capacity to employ fossil fuels is valuable as a means of creating energy, but given this, it makes sense to focus on people’s access to energy as a whole, rather than their access to fossil fuels. Hence, if some have greater access to other acceptable energy sources then they have less need of fossil-fuel-based energy sources. (By an acceptable energy source, I mean one that [a] is neither dangerous nor too costly for the user, and [b] does not impose an unfair burden on others.)

The second and third considerations above are of considerable practical relevance. A recent analysis of the determinants of greenhouse gas emissions concludes that: ‘geography matters when it comes to explaining variation in CO\(_2\) emissions.\(^{15}\) Cold climates and the availability of renewable energy sources exert a statistically significant impact upon such emissions that is also substantively important’ (Neumayer 2004, 39).

A further, fourth flaw in the equal per capita approach is apparent if we consider the concept of mitigation in further detail. Reducing emissions matters, and has the significance it does, because it reduces anthropogenic forcing. It should be understood then as one kind of mitigation. However, as was stressed earlier, mitigation can take various forms. Recall the definition of mitigation by the Intergovernmental Panel on Climate Change (IPCC) (given above in Table 1) as ‘[a]n anthropogenic intervention to reduce the anthropogenic forcing of the climate system; it includes strategies to reduce greenhouse gas sources and emissions and enhancing greenhouse gas sinks’ (Parry et al. 2007, 878). One can mitigate then either by reducing greenhouse gas emissions or by promoting greenhouse gas sinks. Given this, however, it is not clear why we should formulate a distributive principle for greenhouse gas emissions rather than formulate one that applies to people’s anthropogenic forcing as a whole. Suppose, for example, that some support carbon sinks that absorb large quantities of carbon dioxide; why should they have the same emission rights as some who (though they have the opportunity to do so) do not engage in such a project? To allocate both groups equal emission rights is both theoretically unsatisfying (should not duties to mitigate be considered all together?) and unfair (some are engaged in more anthropogenic forcing than others). In short: isolating greenhouse gas emissions when our focus should be on anthropogenic forcing as a whole is a mistake.

This has significance not only when there are natural greenhouse gas sinks. Suppose the technology to create artificial trees that capture CO\(_2\) from the air is developed.\(^{16}\) Those who employ these devices might reasonably be able to argue that they are entitled to greater-than-equal emission rights because when their ‘carbon capture’ records are also taken into account they result in less anthropogenic forcing than that by other people (including those who emit less).

This fifth point can be developed further if we consider the other climate-related duties listed earlier. Table 1 draws attention to five kinds of climate change-related responsibilities. We have discussed the duties to create and maintain greenhouse gas sinks, but there is also the duty to incentivise and transfer clean technology. The latter is required in order to meet people’s energy needs in a way which does not cause climate change and which does not also expose their users and others to other unreasonable risks. If people in industrialised countries are to cut their emissions and if people in developing countries are to develop without causing dangerous climate change, it is paramount that cheap, safe, clean technologies are developed and transported. There is thus a duty to bring about such technological innovation (M-3 in Table 1). And there are, moreover, duties to fund adaptation (A-1) and to provide compensation
Given all this, it is appropriate to ask why we should focus on emission rights without taking into account the broader picture. If X engages in much more adaptation than Y, and/or develops clean technologies for others to use, whereas Y does not, then should this not inform the distribution of emissions?

Finally, it is worth noting that some versions of the equal per capita view start with the greenhouse gas budget and propose to divide that equally. This, however, is vulnerable to the objection that it wrongly ignores the historical record. As was noted in the section above entitled ‘background’, some countries, including the USA and those in Western Europe, have contributed disproportionately to the cumulative level of greenhouse gases because they have been emitting ever-increasing amounts since the Industrial Revolution. They have, moreover, derived great benefit from this. It thus seems quite implausible to ignore this historical record and distribute the remainder equally among humanity regardless of whether they enjoy the benefits produced by the previous 150 years of economic growth or whether they possess none of the benefits produced by the history of high emissions growth and are among the 20% living on less than a dollar a day.

At this point it is worth recording that some of the above criticisms are more intractable than others. In some cases, it might be argued, the appropriate response is not to jettison the equal per capita view but to revise it. To take one recent example, Steve Vanderheiden responds to the fact that some people have greater needs than others (which was raised in the second objection above (see pp. 130–1) but does not exhaust the point being made there) by defending what he terms a ‘modified equal shares model’ (Vanderheiden 2008, 226). This holds that ‘subsistence emissions’ should be distributed so as to meet everyone’s basic needs and then remaining ‘luxury emissions’ should be distributed on an equal per capita basis (Vanderheiden 2008, 226–7, 249). This would not fully meet Sen’s concern with the ‘fetishistic’ character of focusing on resources, but would address the particular concern about poverty and would retain an egalitarian character. To take a second example, some respond to the final objection (see previous paragraph) by starting from the claim that each person has an equal per capita entitlement and then adjusting it to reflect their country’s prior record of emissions.

One might, in similar spirit, retain a commitment to the equal per capita view and then revise it to reflect the fact that some have differential access to energy sources which do not emit greenhouse gases (replying to the third objection listed above). Someone motivated by a commitment to the equal per capita view might also deal with some of the other objections by sticking to the equal per capita view (as duly modified in the light of the second, third and final objections listed above) and then deriving a separate principle to deal with the creation and maintenance of greenhouse gas sinks (thus responding to the fourth objection) and a separate principle to deal with other climate-related responsibilities (thus responding to the fifth objection).

The resulting principle would no doubt issue in quite unequal allocations of greenhouse gases but can legitimately be seen as a variant of the equal per capita view (if perhaps a distantly related variant) since it takes that as its starting point and then adds qualifications and supplementary principles.

Three points can be made about the proposal to adopt a revised equal per capita view. First, it is not clear that the equal per capita view can always be revised to meet the objections mentioned above. For example, the equal per capita view is a resourcist view and Sen’s argument cited in the second objection gives us reason to reject resourcism. Second, the modified egalitarian principle would be tremendously complex and unwieldy and this is a considerable disadvantage. There is, however, a third much more fundamental problem. The problem is this: Even though it might be possible to adopt an approach that takes the form of ‘(a) equal greenhouse gas emissions + (b) revisions + (c) additional principles’, this is not sufficient to justify taking
such an approach. It does not show that it is desirable. We need a positive reason as to why this is an appropriate way of thinking about greenhouse gas emissions and other entitlements. Consider, for example, the first objection listed above. This remains unanswered and its challenge to the equal per capita view retains its bite against a modified equal per capita view. For it is not clear what the rationale would be for retaining a focus on equal greenhouse gas emissions (and then making the above additions and alterations), as opposed to abandoning the exclusive focus on greenhouse gases and concentrating instead on the total package of goods. To refer to the formulation above: there is no rationale for adopting component (a) – starting with equal greenhouse gas emissions. Consider now the fourth objection above. This too retains its force. Why one would want to have a separate principle for one kind of component of anthropogenic forcing (carbon dioxide emissions or greenhouse gas emissions more generally) and then a second separate one for the second component of anthropogenic forcing (maintaining greenhouse gas sinks)? It is peculiar to single out one aspect of anthropogenic forcing and then identify another one and treat them separately rather than consider them in conjunction. After all, they (greenhouse gas emissions and sinks) matter only insofar as they come under the heading of anthropogenic forcing. Consider finally the fifth objection. This also remains a forceful challenge. It might be possible to have one principle for the distribution of greenhouse gas emissions and then other ones (jointly or separately) for other aspects of mitigation, adaptation and compensation. But why do this? What is the rationale? Why not take an integrated view? To refer to the formulation above: we have no reason to adopt an approach that starts with (a) and adds (c), as opposed to one that combines the distribution of greenhouse gas emissions with all other climate-related burdens and benefits.

In short: we have seen that there are a number of serious problems with the equal per capita approach. Many of the weaknesses share a common feature – namely, that the per capita approach focuses on greenhouse gas emissions in isolation from other goods and without putting matters into the relevant context. Thus we saw that the equal per capita approach overlooks the fact that principles of justice focus on people’s overall package of goods and not on each individual component; it focuses on some people’s entitlements without accommodating those with greater needs; and it focuses on one energy source without considering how inequalities in fossil fuel energy sources might be counterbalanced by inequalities in other energy sources. And we also saw that it overlooks the fact that the duty to limit greenhouse gas emissions is only one aspect of mitigation, thereby overlooking the relevance of differential support of carbon sinks. And finally we saw how it ignored the historical record.

**Distributive criterion 3: historical responsibility**

Thus far we have discussed two proposals for the equitable distribution of emissions. I now wish to consider a third. Many approach the question of the fair distribution of emission rights from a historical angle. They adopt what I shall call the principle of historical responsibility. This holds that the appropriate distribution of greenhouse gases should reflect the historical fact that industrialised countries have been emitting greenhouse gases since the Industrial Revolution. Drawing on this, they argue that the industrialised countries should make radical cuts and developing countries may permissibly increase their greenhouse gas emissions. One version of this is the proposal famously made by the Brazilian governmental delegation in the international climate negotiations in 1997 (Brazilian Party 1997). This adopts a particular version of the principle of ‘common but differentiated responsibilities’ (UNFCCC Article 3.1; Kyoto Protocol, Article 10), apportioning differentiated responsibilities on the basis of a differentiated contribution to causing climate change.

Several objections might be pressed against the historical view:
First, some might argue that humans did not have good reason to think that greenhouse gas emissions caused climate change until some point around, say, 1990. Prior to this time, the argument runs, people were excusably ignorant of the effects of their actions and it is therefore wrong to hold them morally responsible for those emissions. To make people liable for their emissions when they could not have known of the consequences of their actions is, this argument contends, deeply unfair on them.

Of course, this objection has little force against the most recent emission of greenhouse gases. It is not clear at what point we can say that ignorance about the link between greenhouse gases and climate change is inexcusable – 1990? – but this does not undermine the point that many greenhouse gas emissions have occurred in a period in which it was known that doing so would have harmful effects. In addition to this first point, two additional arguments can be made in reply. First, even when we lacked sure knowledge of the effects of the emission of greenhouse gases there was a long period during which many climate scientists argued that there was a not insignificant possibility that this could result in global warming. Accordingly, one might argue that major industries and governments of industrialised countries should have acted in a precautionary manner. Clearly, however, they did not and so they may be required to pay for failing to adopt a sufficiently circumspect policy. Second, it bears noting that those who emitted high levels of greenhouse gases also benefited greatly from those emissions. One might grant for the sake of argument that the fact that someone’s actions caused harm to others is not on its own sufficient to obligate them if they were excusably ignorant of the effects of their actions. However, the situation is different if they also benefit from the act that inflicts harm on others. The charge that it is unfair to burden them loses its force if they have gained considerably from the harmful activities and if one insists that the burden placed upon them should not exceed the benefits they have derived (see Caney 2009a in press).

Second, some might argue that it is fair to make people pay for the emissions which they caused, but, they add, many of the greenhouse gas emissions in the atmosphere have been emitted by previous generations – and not by them.

Although members of earlier generations who emitted greenhouse gases clearly cannot now pay for the cost, it does not follow that no one is duty-bound to make up for these emissions. For as a number of thinkers have argued, one might respond that this duty should be borne by those who are currently alive whose current holdings have arisen because of these past emissions. Since their wealth is built on this history of high emissions (and consequent overuse of a shared resource), they have a diminished claim on this wealth and may be liable to contribute to the costs of combating climate change (Shue 1999, 536–7; Neumayer 2000, 189; Gosseries 2004, 42ff; Caney 2009d).

The first two objections are thus unpersuasive. A third point is, however, more significant. The principle of historical responsibility maintains that persons in the past used more than their ‘fair’ share and hence that their descendants should have a reduced quota that reflects the excess emissions of their ancestors. As such, however, it is a necessarily incomplete account of the fair distribution of emissions, for it presupposes an antecedently defined ‘fair’ share. It requires, that is, a second principle (or more) specifying what a fair share of emissions is. The principle of historical responsibility thus needs to be supplemented.

Many, but not all, of those who have affirmed the historical approach have assumed an equal per capita view and then sought to distribute emissions between people today on the basis of the level of emissions of their fellow-nationals in the past. The principle of historical responsibility is not, however, committed to such a view about what constitutes a fair share. It simply requires some principle of fair shares – which might be that everyone has a sufficient amount of emissions to survive or that everyone has a sufficient amount to attain a decent standard of living.
This third point is *not* an objection to the principle of historical responsibility; it is simply a recognition of the fact that it is insufficient on its own to tell us how emissions should now be distributed.

(4) Let us turn now to one final question. The principle of historical responsibility requires us to identify who the actor is who is responsible for the emissions. This, however, is often not straightforward and raises complex issues about causation. Consider three cases. First, consider the case of firms that consume high levels of fossil fuels but then export the products (or services) to foreign consumers. Who is responsible for the emissions? One might focus on the process of production and ascribe the emissions to those who actually burn the fossil fuels or produce cement. On the other hand, one might argue that responsibility should be accorded to the consumers because it is their demand that, at least in part, leads to the process that causes emissions. We thus have a producer-based and a consumer-based approach. This is of considerable practical importance. For example, Bin Shui and Robert Harriss calculate that in the period from 1997 to 2003, ‘about 7%–14% of China’s current CO₂ emissions were a result of producing exports for US consumers’ (Shui and Harriss 2006, 4063). They further report that in this same period, ‘US CO₂ emissions would have increased from 3% to 6% if the goods imported from China had been produced in the US’ (Shui and Harriss 2006, 4063). Moreover, in addition to considering the respective roles of consumers and producers, it would seem reasonable to ascribe some responsibility to government actors. Suppose, for example, that they could have passed regulations prohibiting the use of certain kinds of greenhouse gases but they chose not to. Presumably they are in part responsible for the resultant emissions. So the responsibility may be attributed to consumers, producers, and government officials – but how can we apportion it?

Consider now a second kind of case. Suppose that companies with their headquarters in one country locate some of their power plants in another country. Do we attribute the emissions to the owner of the companies? Or do we chalk them up to the countries in which the physical process resulting in emissions occurred? Or do we ascribe it to the consumers of the products?

Consider, finally, a third case. Suppose that a country hosts an airport which is heavily used by the airlines of other countries. Should the emissions be accorded to the country containing the airport or to the owners of the airlines or to the consumers? My point is *not* that these problems are sufficient reason to reject any historical view, merely that there are some thorny issues concerning its application and that these need to be addressed.

Who are the rights-bearers?

Having considered three accounts of how emissions rights might be equitably shared, I now want to turn to the question of who should be deemed the rights-bearers. What kind of entities should own the permission to emit greenhouse gases – states, firms, individuals, humanity at large? It is striking that much of the discussion of climate change adopts a statist perspective, focusing on the aggregate emissions of different countries and treating states as if they were the rights-holders.

Before commenting on this statist approach it is crucial to distinguish between two separate questions. First, there is the philosophical question – what kind of entity (or entities) holds (or hold) the moral right to greenhouse gases? Are individuals morally entitled to emit greenhouse gases or is this moral right the possession of the state? Second is the practical question – what kind of entity should, in practice, be attributed the legal right to emit greenhouse gases? When designing legal and political systems for mitigating climate change (including, for example, carbon trading schemes), to whom should we accord the legal rights?

In what follows I shall assume that the answer to the philosophical question is that individuals are the moral right-holders. It is individuals who benefit from emissions and need access to
energy sources (including fossil fuels) to meet their needs and pursue their conceptions of the good. Individuals have vital material needs (for heating, food, transportation, cooking and so on) that require energy sources, and these facts can help ground a right to energy sources (which for many requires access to fossil fuels). To hold that individuals are the owners of the moral rights to emit greenhouse gases does not, of course, commit one either to holding that the legal right to emit should be allocated to individuals or to denying that states should be accorded the legal right to hold these emissions. In what follows, however, I want to draw attention to three problems with according states the legal right to possess the greenhouse gas emissions of their members.

(i) First, we need a positive argument as to why states, as opposed to other entities, should be the (legal) rights-bearers. It is not self-evident that they should own emission rights. Consider, for example, the discussion of this issue by the highly distinguished climate economist, Michael Grubb. He starts by saying that ‘every human being has an equal right to use the atmospheric resource’ (Grubb 1992, 37; cf. also 40) but he then concludes that ‘governments’ should own permits (Grubb 1992, 34) and proposes that they should be allocated emission rights in accordance with their population size (Grubb 1992, 37–41). Clearly, however, an argument is required to show why such individualist premises yield the conclusion that states are entitled to pool all these individual rights. Suppose, for example, that someone says, following John Locke, that each individual has a right to decide how to use their labour power (Locke 1986 [1690], chapter 5, §27): it would obviously be grotesque to infer from this that their state has the right to sell this labour power to others and receive the benefits from the sale. If we start with a commitment to each individual’s human rights then we need a very good argument to show why the state is then entitled to pool these rights and decide whether to sell these rights to others.26

(ii) Second, to treat states as the fundamental owners of emission rights (and to focus solely on ensuring that states receive a certain quota of emissions) ignores the vast differences in emission levels within states and can thus give a very misleading picture. Some developing countries may include some people who are high emitters and with a great ability to pay, and some Annex I countries may include some who are low emitters and desperately poor. Focusing on states does not enable us to pick this up. Consider, for example, the disparities that exist within China:

Shanxi province, to the west of Beijing, is the leading consumer of coal, primarily for the production of coke, and has the highest per capita emissions in the country. Per capita emissions from China as a whole have risen to 1.1 tonnes C/person, but in Shanxi province, a leading coal producer, this rate is 3.3 tonnes C/person, equivalent to per capita emissions rates in Western Europe. (Gregg, Andres, and Marland 2008, 3)

Striking disparities also exist in the USA, India, and within European countries. To treat states as the owners of emission rights overlooks these important inequalities within states. It has the implausible implication that justice could be done so long as emission rights were shared appropriately between states – even if it is the case that some in a state may lack sufficient emissions to survive whilst others possess emissions of which they have no need. Treating states as (legal) rights-holders thus comes at a moral cost.

(iii) Finally, and on a more practical note, to treat states as the owners of emission rights has morally problematic consequences. For example, the leaders of unjust states may simply use these carbon permits to enrich themselves and without any intention to benefit their own subjects. This point can be related to an argument developed by Thomas Pogge. Pogge has forcefully criticised what he terms the ‘international resources privilege’, where the latter is the practice whereby states recognise all other states as the legitimate owners of the natural resources in their own jurisdiction even if they are thoroughly unjust (Pogge 2008, 29–30, 119–21, 168–72). Now granting states this extra resource privilege (the ownership of emission rights) has two malign effects. First, corrupt leaders of some states can benefit themselves
and further strengthen their position. Second, there is a high chance the poor in their country may receive neither the emissions nor the revenues generated. If there is a system of carbon trading which allocates rights to states it would allow some unjust states to deprive their own people of emission rights and sell the rights to foreigners (for related concerns, see Nordhaus 2008, 159–60).

For these three reasons, a statist approach to the distribution of emissions is profoundly troubling. Given a commitment to the moral rights of individuals, there is an urgent need either for reforms that improve the statist approach or for non-statist mitigation programmes that more reliably distribute emission rights (or the benefits of emission rights) directly to individuals.

**An alternative approach: theory**

Thus far I have criticised three different distributive criteria and have drawn attention to the problems in statist and individualist accounts of who should bear emission rights. In the next two sections I outline the beginnings of a new approach. This section outlines three normative claims. The next section outlines how the normative theory could be applied in practice.

The first thesis that I wish to advance holds that:

**THESIS I: THE REJECTION OF THE ASSUMPTION THAT THERE IS A DISTRIBUTIVE PRINCIPLE FOR EVERYTHING:** The fact that there are activities which involve greenhouse gas emissions does not entail that there should be a principle of distributive justice specifying a fair distribution for these greenhouse gas emissions.

Thesis I is supported by two arguments. First, it is grounded in the more general point that it is wrong to suppose that if there is some ‘stuff’ then there must be a distributive principle that specifies a fair distribution of that stuff. There are many scarce resources – from plutonium to aluminium – but we do not think that there is a distributive principle that applies just to plutonium, say. Second, and in addition to this, Tim Hayward has correctly pointed out that emissions of greenhouse gases have value because, and to the extent that, they contribute to a good – namely, they are involved in the creation of some energy which meets important human needs (Hayward 2007, especially 441–4 and 446–7). They do not have value in and of themselves; they only have value because they serve valuable goals. Moreover, fossil fuels are obviously not the only source of energy and they are substitutable by other energy sources (such as renewable energy). What matters, then, is that there is a fair distribution of energy. Therefore what we should seek are principles for the fair distribution of energy use (and its burdens) – not greenhouse gas emissions.

This first thesis sets the scene for a second thesis. This holds that:

**THESIS II: THE ANTI-ATOMIST PRINCIPLE:** With the exception of some special cases, distributive justice requires the fair distribution of a combined set of goods. As such, the distribution of greenhouse gases (or energy use) can be fair if it is part of fair package of goods.

This second thesis states that there is no such thing as a fair distribution of greenhouse gas emissions per se. Rather, there are fair principles which govern a person’s overall set of goods (one, but only one, of which is the good of engaging in activities which emit greenhouse gases). Thesis II stands opposed to the ‘atomist’ view which says that there must be a distributive principle for each benefit. It holds that a person’s fair share involves a combination of different benefits (access to health, education, income) and burdens (arduous jobs, less income, hazards), but there is no uniquely best combination of them. In practical terms, this means that there can be unequal emissions if one person’s shortfall with respect to emissions is made up by their greater access to either other energy sources or some other goods (and if the combination is reasonable).
Note that Thesis II is not committed to holding that every good can be traded off against other goods. It allows that there are cases where this is impermissible. One example, given earlier, is of voting rights. These should be distributed equally. One might also say that some access to the natural world is also not substitutable with other goods. Thesis II simply contends that for many goods, including the ability to emit greenhouse gases, what matters is the fair distribution of the overall set of resources.

Let us turn now to a third, distinct, normative claim. My third proposed claim asserts that:

**Thesis III: The Revenue Principle:** A fair distributive principle governing greenhouse gases need not take the form of, (a), distributing permits to emit greenhouse gases, and can take the form of, (b), distributing the revenues raised by selling greenhouse gases.

The preceding theories have assumed that permits to emit greenhouse gases should themselves be distributed, but, as a number of other proposals have brought out, another approach is to distribute not the actual permits to use greenhouse gases but rather the proceeds from the sale of greenhouse gases. Four examples may illustrate this point. Consider first the example of the Permanent Alaska Fund. Article IX section 15 of the Alaska State Constitution specifies that a proportion of the revenues raised from a number of sources (most notably from the sale of oil) should be collected by the state and then each citizen of Alaska should receive an annual dividend. Under this scheme, it is not the case that each citizen privately owns a proportion of the oil; rather, he or she owns a proportion of the revenue raised by the sale of the oil. A second example of the same kind of idea comes from Thomas Pogge. Pogge has argued that there should be a global resources dividend. Under this scheme, those who use natural resources should pay a small fee for doing so. These fees should be collected together under the heading of the global resources dividend and then the payments will be disbursed to all members of the world. Under Pogge’s scheme, then, humanity might be said to have a claim on all the world’s natural resources. However, Pogge does not interpret this to mean that the earth’s natural resources should be shared among everyone. Rather, he interprets it, in line with Thesis III above, to mean that everyone should have a share of the revenues raised by charging for use of the earth’s natural resources (Pogge 2008, chapter 8). A third example can be found in the Commission on Global Governance’s report, *Our Global Neighbourhood*. This too argues that there should be ‘charges for use of the global commons’ (Commission on Global Governance 1995, 220). Under this heading it suggests: charging for use of the ocean for sea travel and for fishing; charging for the permission to release non-toxic levels of waste into the sea; levying fees for the use of Antarctica; ‘parking fees (or auction revenues) for geostationary satellites’; and ‘charges for user rights of the electromagnetic spectrum’ (Commission on Global Governance 1995, 220–1). In each case the proposal is not that all citizens of the world own a private share of the ocean or the electromagnetic spectrum or some other stuff. The thought is rather that humanity owns it as a whole and user rights can be charged or auctioned which then raise revenue for valuable goals. One other proposal made by the Commission on Global Governance is that fees be levied on air flight (Commission on Global Governance 1995, 220). This idea is developed in much greater length in my fourth illustration of Thesis III. For Benito Müller and Cameron Hepburn have proposed that there should be an International Air Travel Adaptation Levy (IATAL) (Müller and Hepburn 2006). This would involve charging a levy on air travel and the funds would then be devoted to adaptation. In short, then, a fair emissions policy may take the form of disbursing the revenues raised from selling permits rather than allocating permits. This point will be illustrated further in the next section.

Before doing so, however, I wish to introduce a fourth thesis. This additional thesis introduces a qualification to the preceding two theses. It states:

**Thesis IV: The Subsistence Emissions Principle:** Each person is entitled to that level of emissions required for them to attain a minimal decent standard of living.
This claim holds that persons have a right to ‘subsistence emissions’ (Shue 1993). It thus endorses the proposal that there should be greenhouse development rights (Baer, Athanasiou, and Kartha 2007). Thesis IV is grounded in a recognition that everyone is entitled to a basic standard of living and that for very many this will require access to greenhouse gas emissions.

Thesis IV qualifies the preceding three theses and sets parameters that they must all honour. Consider Thesis I: taken to its logical extreme, Thesis I suggests that any distribution of greenhouse gas emissions can be fair. And Thesis II similarly suggests that any shortfall in emission rights can be compensated for by having extra goods. There are, however, limits to both theses. Regarding Thesis I: at some point, if a person lacks access to other energy sources, then he or she will need to be able to emit a certain amount of greenhouse gases. Fairness thus requires some minimal standard of distribution of greenhouse gases. This point also qualifies Thesis II. In a world where many lack access to renewable energy sources, greenhouse gas permits are not perfectly substitutable. It is therefore not the case that all distributions of greenhouse gases are fair and it is also not the case that all shortfalls in emissions can be made up by the addition of other goods.

Consider now Thesis III: what Thesis IV shows here is that there are limits to the extent to which one can adopt option (b) rather than option (a). One might decide to sell a large proportion of the emission rights and then (in line with [b]) distribute the revenues among the members of the world. However, option (a) cannot be disregarded altogether. For many people (those without access to clean energy sources), there is a need for fossil fuels to meet their basic energy needs.

In short, then, I have argued that:

1. everyone should have access to whatever level of greenhouse gas emissions is essential for a minimum standard of living (Thesis IV).
2. there is no uniquely correct distribution of greenhouse gas emission rights (Thesis I);
3. there can be different levels of greenhouse gas emissions for different persons if their overall package of resources (and the combination of resources) is fair (Thesis II); and
4. distributive justice can be served by selling emission rights and distributing their revenues to individuals (Thesis III).

An alternative approach: practice

The last section advanced four key components of a theory of fair emissions. This section moves from theory to practice, and considers what this might mean in practice. I do so by outlining one way of distributing emissions which would satisfy Theses I, II, III and IV. I do not say that this is the only way of doing so, but I outline it to show that the abstract principles stated above can be translated into practice.

The model in question has the following features. First, it starts from a commitment to the cosmopolitan view that the atmosphere belongs to humanity at large. In the words of one of the leading proponents of the approach I am outlining, this approach ‘recognizes the atmosphere as a “global commons” – a resource that is the common property of humanity’ (Tickell 2008, 68). Or, as another puts it, ‘the atmosphere belongs to everyone equally’ (Barnes 2008, 56). On this view, the atmosphere does not belong to firms or countries or to any private individual. This constitutes its answer to Q2. In this respect it agrees strongly with the starting point adopted by proponents of the equal per capita view, for they too think of the world’s atmosphere as a ‘common resource’ (Vanderheiden 2008, 104) and as a ‘global common’ (Agarwal and Narain 1991, 13).
Second, the view to be discussed holds that an international body should determine a fair level of greenhouse gas emissions – a carbon budget – and that the size of this budget should decrease over time to prevent dangerous climate change. However, in contrast to all the views considered so far, under this scheme permits to emit greenhouse gases should be sold at an auction and those who wish to emit greenhouse gases, such as firms, must purchase permits to do so. This scheme thus employs what economists call an ‘upstream’ approach because the distribution (via auction) of permits takes place closer to the point of production. ‘Downstream’ systems, by contrast, distribute permits directly to consumers. We now then have an answer to Q1. Emissions are distributed at an auction to the highest bidder.

The third, and final, core feature of this system concerns the revenues raised from the auctions. For on this proposal, the proceeds raised are to be spent on efforts to combat climate change – funding mitigation projects, fostering technological development, enabling adaptation in developing countries and compensating those who have already been harmed.

This kind of approach has been defended at length by Oliver Tickell in his book Kyoto2 (2008), and Peter Barnes has defended similar ideas in a number of publications (2001, 2006, especially Part 2, and 2008, especially Part 3).37 Barnes gives a crisp formulation of his version of this approach in an article in Science co-authored with Robert Costanza, Paul Hawken, David Orr, Elinor Ostrom, Alvaro Umaña and Oran Young (Barnes et al. 2008). The latter defend what they term an ‘Earth Atmospheric Trust’ in which there is an ever-decreasing carbon budget and permits are auctioned off. On their view, half of the dividend should be distributed to everyone on an annual basis. The remaining half should be spent on combating climate change (through incentivising clean technology, developing renewable energy and funding carbon sequestration) (Barnes et al. 2008, 724).38

Let us turn now to the four theses introduced in the last section. Note, first, that the approach sketched above clearly accepts Thesis III. By contrast with the proposals considered earlier, it does not distribute emission rights to individuals so much as distribute the proceeds of selling emission rights to people. Note too that it honours Thesis I, for it does not treat greenhouse gases as a ‘stuff’ with its own distributive principle. Consider now Thesis II. This requires principles of justice to apply (in general) to people’s overall package of goods (and not, in normal cases, to one single burden or benefit). The upstream auction will honour this principle because the revenues raised from the auction are to be spent (in part or in their entirety) on mitigating and adapting to climate change. By doing so they protect a number of different kinds of human interests – including life, health, subsistence, and autonomy. The auction scheme thus does not single out one particular good and apply a particular distributive principle to it. Rather, its use of revenues advances a number of different goods.39 Finally, we can observe that this approach can be designed to honour Thesis IV. That is to say, it can exempt certain necessary emissions from the auction system. Alternatively, it can ensure that revenues from the auction are distributed to the least advantaged to ensure that they have access to the energy sources they need to attain a minimum standard of living. The scheme outlined above can, then, honour each of the four theses stated earlier.

More generally, this approach has a number of virtues. First and foremost, it simultaneously performs two tasks, for it both lowers the total amount of greenhouse gases being emitted, thereby contributing to the mitigation of climate change, and it also generates revenue which can be employed to fund adaptation and sponsor attempts that further lower anthropogenic forcing (Barnes et al. 2008; Tickell 2008). This is of vital importance because money is required to assist developing countries to adapt to the climate change to which the world is already committed. In addition to this, it is widely recognised that to prevent further climate change it is essential to develop and transfer clean technology to all, especially to developing countries. Without this, they lack the possibility of developing without contributing further to the
problem. The revenues raised by an auction can thus be employed to fund (i) adaptation and (ii) technological innovation needed to engage in successful mitigation.

Second, this proposal avoids the problems that beset both individualist and statist accounts considered earlier. Allocating individual permits to all the world’s citizens is utopian. However, as noted earlier, allocating permits to states is also morally problematic. One problem is simply that doing so treats states as homogeneous units, but emission levels vary enormously within states. Some states, like India, have a low per capita emissions level but nonetheless contain many people who are high emitters and who ought to pay. Allocating rights to states will not do anything to make sure that the highest emitters within that country pay the appropriate cost. It is true that a state might choose to do so but it might not. The auction-based scheme is, however, more sensitive to this issue. Since firms are likely to buy these emission rights they will pay the cost for their emissions and to the extent that the costs are passed onto consumers then those who choose to purchase will bear the costs of their decisions. The auction-based scheme is thus much more discriminating and nuanced.

Conclusion

There has been a long-standing debate about how emission rights should be distributed and to whom they should be distributed. In this article I have examined and criticised several leading approaches. In their place I have defended an alternative view that changes the terms of the debate. This both has sound normative foundations (see the section above entitled ‘A Different Approach’) and can be realised in practice (see ‘An Alternative Approach: Practice’, above).

Notes

1. This article was written while I held an ESRC Climate Change Leadership Fellowship (2008–2011) and I am very grateful to the Economic and Social Research Council (ESRC) for its support. The article has been presented as a paper at the conference on ‘Ethics and Climate Change: Scenarios for Justice and Sustainability’ at Padova (23–25 October 2008), at the Oxford-Princeton workshop on ‘Global Norms and Global Justice’ (30 October 2008), at the seminar at the Warwick Centre for Ethics, Law and Public Affairs (4 February 2009), at the Smith School for Enterprise and the Environment (23 February 2009), and at the ‘Environmental Norms, Institutions, and Policy’ seminar series at Stanford (5 March 2009). I am grateful to the audiences at these occasions and am particularly grateful to Robin Attfield, Göran Duus-Otterström, Dave Frame, Lauren Hartzell, David King, David Miller, Ed Page, Debra Satz, Steve Schneider, Kai Spiekermann, Zosia Stemplowska, Victor Tadros, Andrew Walton, and Andrew Williams for their questions. I owe a special debt to Bob Keohane, my commentator at the Oxford-Princeton workshop, and to Avia Pasternak, my commentator at Stanford, for their illuminating suggestions; to Aubrey Meyer for his helpful comments and discussion; to Don Maier for his lengthy written comments; to Narasimha Rao for advice about empirical material on India and China; and to Jay Gregg for helpful correspondence about measurements of China’s carbon emissions.


3. Table 1 is not fully comprehensive. A number of scientists and economists have proposed ‘geo-engineering’ solutions, so this should arguably be added to the set of responsibilities. Geo-engineering has been challenged on scientific and ethical grounds and so I shall set it aside here. I have discussed it elsewhere (Caney forthcoming).

4. See, for example, S. Socolow and R. Pacala’s important and influential article (Socolow and Pacala 2004). This is not intended as a criticism of this important paper. The point is that before deciding whether to implement their proposal for 15 separate ‘wedges’ one needs to ascertain how the costs associated with this programme would be distributed and whether their scheme can be designed so that the burden is distributed equitably.

5. They cite the International Energy Agency (2002).
6. This historical principle should be distinguished from another historical principle that some might invoke to criticise grandfathering. Some might argue that if one group of people have already enjoyed access to a scarce good (in this case, using the earth’s absorptive capacity), it is reasonable to require them to give way so that others can now have access to it. The thought is simply that standard accounts of the acquisition of some scarce resource invoke some kind of proviso. The best-known example of this kind of view is, of course, John Locke’s ‘proviso’ governing the use of natural resources. See Locke (1986 [1690]), chapter 5 (‘Of Property’), §27.

7. The point is expressed nicely by John Rawls’s famous statement: ‘to each according to his threat advantage is not a conception of justice’ (Rawls 1999, 116).


9. Of course some might seek to give more principled (as opposed to pragmatic) arguments for grandfathering, hoping to show that it is in fact a fair distributive principle. For example, some might try to defend grandfathering on the grounds that people are entitled not to have their expectations thwarted. For discussion, see Gossseries (2005, 297–301).


11. See also http://www.gci.org.uk/.


13. This point has also been forcefully made by Derek Bell (2008, 250) and David Miller (forthcoming). See also Caney (2009b).

14. See again Miller’s (forthcoming) incisive critique of the equal per capita view.

15. See also Neumayer (2002, 7–12). It might be argued that those who live in hot countries also need high levels of energy to cool themselves. Neumayer (2004, 37–9) finds, however, that this is not the case.

16. See on this the discussions by Lackner, Grimes, and Ziock (2001) and by Keith, Hu-Duong, and Stolaroff (2006, 17–45). See also the discussion of the work by Klaus Lackner by Kunzig and Broecker (2008), especially chapters 14 and 15.

17. The terminology of ‘subsistence emissions’ and ‘luxury emissions’ comes from Shue (1993).

18. Neumayer, for example, starts from the claim that each person has a right to emit an equal per capita amount carbon dioxide but then seeks to adjust each person’s entitlements in light of their country’s ‘Historical Emission Debt’ (Neumayer 2000, 186). This presupposes that countries are a morally significant unit such that if a nineteenth-century Briton emits more than his allotted quota then a later Briton is entitled to a correspondingly smaller quota. Why ‘nations’ or ‘states’ should be the appropriate reference group is unclear. Which entities should be treated as the rights-holders of emission rights is discussed later.

19. Note that differential access to clean energy sources matters not simply in cases where it entails that people have unequal ability to meet basic needs. The issue is a more fundamental one: why should one equalise one energy source without regard to access to other energy sources?

20. Perhaps those who maintain greenhouse gas sinks could be given extra emission permits.

21. This proposal was referred to the Subsidiary Body for Scientific and Technological Advice (SBSTA). See Secretariat of the Subsidiary Body for Scientific and Technological Advice (2001).

22. For other versions of this third point, see Singer 2002, 34; Gossseries 2004, 40–1; and Baer 2006, 136.


25. This third example was suggested by the FAQs section of the Carbon Dioxide Information Analysis Center (CDIAC). See question 11 (http://cdiac.ornl.gov/faq.html#Q11) and Tom Boden’s response. Boden (director of CDIAC) writes, ‘Many small island nations have military bases that are used for re-fueling or have large tourist industries. Who do you assign the emissions to; the US whose military planes are re-fueling on the Wake Island with aviation and jet fuel or the Wake Island?’

26. I am not saying that no argument could be given that could justify this pooling. My point is just that we need an argument for this inference. (I do doubt, though, that any human rights based argument could establish that the citizens’ individual rights could legitimately be held by their state independently of how unjust and illiberal it is.)
27. I owe this point to Cameron Hepburn.
28. See, again, the points made by Bell 2008, especially 250–1 and 254; Caney 2009b; and Miller forthcoming.
30. There have been extensive debates about whether the destruction of natural goods can be compensated for by the creation of human capital; for discussion, see Dobson 1998.
31. This possibility is noted by Axel Gosseries. He, though, does not explore option (b) and adopts an (a)-like approach (Gosseries 2005, 296). Gosseries says that (a) is closer to what is being applied by the Kyoto Protocol. It is not clear why, however, we should be guided here by what is actually happening in practice. Furthermore, if we are to be guided by what is occurring in practice, then it bears noting that recent developments in the EU ETS fit well with option (b) (see section on ‘An alternative approach: practice’). Gosseries also suggests that (a) fits better with egalitarian thinking (2005, 296), but this is not self-evident. I can see no reason why egalitarians cannot endorse (b).
32. For information, see http://www.apfc.org/home/Content/home/index.cfm and https://www.pfd.state.ak.us/. The content of Article IX section 15 can be found at http://www.apfc.org/home/Content/fundlaw/constAndLaw.cfm. For further information about the Alaskan Permanent Fund, see Anderson 2002.
33. For a contrary view (and defence of his preferred alternative), see Steiner 1999.
34. In Henry Shue’s nice phrase, emitting greenhouse gases is an ‘avoidable necessity’ (Shue 1995). It is ‘necessary’ because many people need to be able to emit greenhouse gases to achieve a minimum standard of living. And it is ‘avoidable’ because this necessity arises because major political and economic actors have designed and perpetuated an energy regime that is heavily reliant on the use of fossil fuels. Those elites could redesign our energy regime in ways that are more energy efficient and utilise other energy sources.
35. This is compatible with some people being entitled to none where they have secure access to renewable energy sources.
36. For analysis of the global commons and the common ownership of the atmosphere, see Risse (2008).
37. See also http://www.earthinc.org/. For my own defence of an auction system, see Caney (forthcoming).
38. An auction scheme is also defended by Ross Garnaut in Garnaut (2008, chapter 14, especially 331–2). The case for auctioning permits to emit greenhouse gases has also been advanced by Hepburn et al. 2006.
39. One might go one step further and argue that the revenues raised should be spent wherever they would have the greatest effect. We thus face a choice between hypothecating the funds and using them to address climate change or spending them in those ways which result in the greatest benefit. The latter might seem to be the most rational. However, against this it is arguable that hypothecation produces stable supplies of money and, moreover, that spending the revenues on other areas will simply result in a decrease in the other funds being spent on those other areas. For good discussions of the rationale for hypothecation, see Müller (2008) and Oxfam and WWF (2008).

References


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