CHAPTER 4

Climate change, energy rights, and equality

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It is now widely recognized that the Earth’s atmosphere is undergoing profound changes. The most recent report of the Intergovernmental Panel on Climate Change (IPCC) states that temperatures have increased in the last hundred years. It writes, for example, that "[t]he total temperature increase from 1850–1899 to 2001–2005 is 0.76°C ± 0.19°C," adding ominously that "[t]he rate of warming averaged over the last 50 years (0.13°C ± 0.03°C per decade) is nearly twice that for the last 100 years." In addition to this, temperatures are projected to increase in the future. All of the six scenarios considered by the IPCC found that temperatures will rise by 2090–2099 as compared to the temperatures between 1980 and 1999. According to the best estimate of the B1 scenario, temperatures will increase by 1.8°C. If on the other hand we turn to the A1FI scenario, its best estimate is that temperatures will increase by 4.0°C. And if we examine the "likely range," then the lower limit is 1.1°C and the higher limit is 6.4°C.

Sea levels, too, are projected to increase. According to one scenario (the B1 scenario), sea levels are projected to rise by 0.18–0.38 meters and according to another (the A1FI scenario), the increase is projected to be 0.26–0.59 meters. These projections are important to add, do not include "future rapid dynamical changes in ice flow." They omit, that is, the massive sea-level

1 This paper was presented at a conference on "Global Environmental Theory and Practice" at San Diego State University (April 10, 2008) and a conference on "Energy and Responsibility" at the University of Tennessee (April 11, 2008). I am grateful to audiences at both for probing questions. I am especially indebted to Ted Sokol (my respondent at San Diego). I am also grateful to Richard Arneson, Carol Gould, Aaron James, Bruce Landsman, Nicole Hassoun, and Henry Shue. I wrote a first draft of this paper while I was a Leverhulme Research Fellow and completed it while holding an Economic and Social Research Council (ESRC) Climate Change Leadership Fellowship. I am grateful to the ESRC and the Leverhulme Trust for their support.


3 Ibid., p. 70.

4 Ibid.

5 Ibid.

6 Ibid.
rises that might occur because of the melting of ice sheets. In addition to these temperature increases and sea-level rises, climate change is projected to result in a rise in the severity and the frequency of severe weather events.

All of these changes, of course, pose grave threats to humanity, to non-human animals, and to the natural world. If we focus solely on human impacts, we can say that anthropogenic climate change will jeopardize the following fundamental interests:

(a) health (because of water-borne diseases, vector-borne diseases, and heat stress)
(b) life (because of freak weather events – such as storm surges, hurricanes, tornadoes, and violent flooding)
(c) subsistence (because of crop failure, flooding of agricultural land, and the loss of land because of salinization and sea-level rise)
(d) the capacity to attain a reasonable standard of living (because of damage to infrastructure, roads, and buildings).

Given this, humanity has, other things being equal, good reason to cut greenhouse gas emissions so that the total concentration of greenhouse gases is not so great as to result in “dangerous anthropogenic interference” (Article 2, United Nations Framework Convention on Climate Change) with the Earth’s climate. There are a number of different greenhouse gases – carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). The question we thus face is what level of greenhouse gases in the atmosphere is acceptable. One common way of thinking about this has been to hold that we should aim to prevent the global average temperature from rising by more than 2°C (from the Industrial Revolution). This is, for example, the climate goal that has been adopted by the European Union. To avoid this rise, the concentration of greenhouse gases in the atmosphere may not exceed a certain level of concentration (a figure in the region of 450 ppm is often proposed). Specifying the exact threshold is, however, fraught with problems. Determining what constitutes “dangerous anthropogenic interference”

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requires both normative criteria as to what constitutes a "dangerous" level as well as highly complex scientific analysis.\textsuperscript{9} Given this, it bears noting that some hold that an increase of less than $2^\circ$C is also ethically troubling. In a comprehensive survey, Rachel Warren has documented many adverse effects that have been projected to occur if temperatures increase by less than $2^\circ$C. These include the loss of some species, crop failure in Africa, increased exposure to disease, the melting of the Greenland ice sheet, and an increased probability of the collapse of Atlantic thermohaline circulation.\textsuperscript{10}

It is thus difficult to specify the upper limit by which temperatures may increase. Nonetheless, however one frames the appropriate target, it is clear that there is a target of greenhouse gas concentration above which we should not go. Now suppose that one has a target level of the concentration of greenhouse gases in mind. We can then try to determine from this roughly what volume of greenhouse gases can safely be released into the atmosphere. This figure tells us how much people across the world may jointly emit. Given this, we then need to know how the right to emit this total volume should be distributed among humanity. This is the question that this chapter shall examine.

Prior to answering it, we might consider some challenges to the preceding line of reasoning. First, some, of course, might contest the argument presented above, arguing that it presupposes that the appropriate response to anthropogenic climate change is to seek to "mitigate" it and, they argue, this is wrong. We should instead concentrate on adaptation and need not mitigate. If we, as a species, continue to grow economically, then we can afford to adapt at a later stage. This, it might be said, is more rational than cutting down the economy now.\textsuperscript{11}

There are, however, at least two distinct reasons why this challenge fails. First, this answer assumes that increased economic growth will enable future generations to adapt but we have good reason to doubt that this is the case. (i) Our understanding of exactly when and where climatic harms will occur is too poor for us to know exactly where preventive measures should be taken in advance of their occurring. In addition to this, (ii) adaptation requires accountable and responsive governance. Increased wealth, on its own, is unable to help


people living in countries with unaccountable political structures to cope with
dangerous climate change. (iii) We also have no assurance that the future
wealth will be distributed in such a way as to enable the vulnerable to adapt.
Increased wealth is quite compatible with having radical inequalities. It would
require an act of faith to think that the rich will be motivated to spend these
resources enabling the global poor to adapt. For these reasons, economic
growth may not enable people to adapt with dangerous climate change.

In response to this it might be argued that even though adaptation may
not be possible in all or many cases this does not mean that one should
mitigate now. It would be better, so the argument runs, for humanity to
experience economic growth even if this results in the creation of certain
harm (such as the loss of small island states) because with the increased
wealth one can remunerate the victims of these dangerous climatic events.
Even if money cannot ensure that people adapt, it can be employed to
compensate people for their loss.

As a number of critics have pointed out, however, the assumption that
the loss of a good can always be compensated by the granting of another
good or goods is highly disputable. Individuals have rights to a decent
environment and one cannot then violate any of them with a view to
compensating later. In addition to this some goods are not “substitutable”
and loss of them cannot be replaced by supplying another. They are
irreplaceable. It would therefore be wrong to destroy them now with a
view to “compensating” those ill affected by this at a later stage.

A second, quite separate, reason to reject the “grow-then-adapt” (or
“grow-then-compensate”) argument is that it is widely recognized that
not mitigating now with a view to adapting later is by far the most expensive
option. This is one of the key findings of the Stern Review. For that reason
alone it should be rejected.

Global Environmental Economics (Malden, MA: Blackwell, 1999), edited by Mohammed H. I. Dore
and Timothy D. Mount, pp. 40–42; and Clive L. Spash, Greenhouse Economics: Value and Ethic
(London and New York: Routledge, 2002), pp. 211–236. Shue grounds his argument on an appeal to
the inalienability of certain rights. I do not think that inalienability is required to ground this
objection. Even if a right is alienable (by the right-holder deciding to waive it) it is wrong for others
to trespass on it without the right-holder’s consent.

Neumayer, Weak Versus Strong Stakes: Exploring the Limits of Two Opposing Paradigms
(Chesterham: Edward Elgar, 2005), 2nd edn.

For a further discussion of these issues see Caney, “Climate Change and the Future: Time, Wealth

Sir Nicholas Stern, The Economics of Climate Change: The Stern Review (Cambridge University Press,
2007).
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A second challenge to the argument sketched above would be to maintain that cutting the use of fossil fuels is not necessary because humanity can adopt technological solutions which prevent dangerous climate change. Geo-engineering, it might be argued, is required – not mitigation. There are a variety of different geo-engineering proposals that have been mooted. Some propose injecting sulfur in the atmosphere to enhance the Earth’s reflectivity. Others have explored the possibility of putting mirrors in space to reflect the Sun’s rays. A third proposal is to insert vertical pipes in the ocean pumping water from the bottom to the surface in order to stimulate algae. This would both absorb carbon dioxide and generate dimethyl sulfide, which, in turn, helps to produce clouds which can reflect the Sun. Fourth, and finally, some have proposed iron fertilization of the oceans – the intention being to encourage algae to grow and absorb carbon dioxide.

There are a number of well-known objections to many of these geo-engineering projects. First, the science is highly uncertain and there is disagreement about the efficacy and cost of such measures. The Fourth Assessment Report, for example, reports that geo-engineering ventures “remain largely speculative and unproven.” To give one specific example: Klaus Lackner of Columbia University argues that iron fertilization of oceans may not succeed. He claims that “[i]f the detritus does not sink deeply enough, it would be available through long-term mixing in a relatively short time – years to decades. This could put the CO₂ back in circulation in the next 50 years – precisely when things are most critical.”

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Second, there are risks attached to each of these options. For example, iron or phosphate fertilization of the oceans may lead to an increase in methane hydrates, which would make climate change even worse.22 In addition, releasing sulfur particles into the atmosphere runs a considerable risk of causing ozone depletion.23 Furthermore, a recent study by Kevin Trenberth and Aiguo Dai concludes that one cost of sulfur injections into the atmosphere is that “cutting down solar radiation is apt to reduce precipitation,” thereby “[c]reating a risk of widespread drought and reduced freshwater resources.”24 Furthermore, Alan Robock of Rutgers University argues that all geo-engineering projects will have a cost because by adopting a response that does not involve cutting carbon dioxide emissions they “would allow continued ocean acidification, because some of the carbon dioxide humans put into the atmosphere continues to accumulate in the ocean.”25

Third, as Dale Jamieson and Stephen Gardiner have argued, there are considerable ethical problems with this kind of meddling with the natural world. It can be seen as a kind of hubris and a lack of an appropriate sense of humility. What right does humanity have to disfigure the natural environment in this way?26

In addition to all of the above, there are political problems, too. For example, what if the wrong people got hold of the techniques?27 Furthermore, geo-engineering would require extensive and long-term global cooperation—a condition that seems unlikely to be met. Moreover, it would be likely to generate disputes. Suppose that some countries experienced climate problems: They would likely blame those engaging in geo-engineering for these.28

22 See Keith, “Geoengineering the Climate: History and Prospect,” p. 270.
23 Ibid., p. 271.
28 For the last two political problems see Stephen Schneider, “Geoengineering: Could—or Should—We Do It?”, Climatic Change, 31, 3 (1996), p. 299.
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With all this duly noted, it is advisable to disaggregate different kinds of geo-engineering. It would be wrong simply to assume that all geo-engineering projects are liable to the same problems. However, even if we do this and even if some geo-engineering projects can meet the preceding four challenges, it would be highly implausible to think that a policy of geo-engineering would entirely obviate the need for lowering greenhouse gas emissions. For all these reasons, geo-engineering does not remain a viable alternative to mitigation. The case for cutting the emissions of greenhouse gases thus remains.

A third challenge to this proposition comes from those who argue that people have an interest in development and that this takes priority over the need to combat climate change. It would therefore be wrong to insist that people cut their emissions of greenhouse gases. This critic might quite rightly emphasize the dire poverty of those who live in developing countries. The poor living in China and India, they maintain, have a right to develop and thus no reason to cut emissions. The claim is that one cannot jointly realize both (A) the goal of mitigating climate change and (B) the legitimate development of the global poor. Let us call this challenge the development challenge. The development challenge raises many complex problems which cannot be resolved in a short space.

Several points can nonetheless be made to refute the objection. First, it bears noting that dangerous climate change is harmful to the economic development of countries like China and India. Rising sea levels, increased temperatures and more freak weather events will wreak havoc with the aspirations of those in Asia, China, and Africa to develop economically.


10 An additional point is made by Roger Angel. Having described how the very many sunshades could be launched into space to create a large sunshade, he concludes his analysis by saying, “[I]t would make no sense to plan on building and replenishing ever larger space sunshades to counter continuing and increasing use of fossil fuel. The same massive level of technology innovation and financial investment needed for the sunshade could, if also applied to renewable energy, surely yield better and permanent solutions. A number of technologies hold great promise, given appropriate investment.” Angel, “Feasibility of Cooling the Earth with a Cloud of Small Spacecraft Near the Inner Lagrange Point (L1),” p. 1789.

In this sense we do not face a choice between development or protection of the Earth’s atmosphere. The latter is a precondition of the former. Second, to see why (A) and (B) are jointly compatible it is important to focus on who should mitigate. Now my suggestion is that on any plausible account of who should combat climate change, the larger portion of the burden rests with the members of affluent industrialized countries like the USA. If, for example, one affirms a polluter pays principle, this entails that members of Western industrialized economies (who are after all responsible for 75 percent of total emissions) should pay. The per capita emissions of the overwhelming majority of people in India or China are still very low. For instance, in 2006 the average emissions of a Chinese person were just over a quarter of those of the average American. More precisely, the per capita emissions of the Chinese were 4.7 tonnes of CO₂, whereas the per capita emissions of Americans was 19.3 tonnes. If we consider the emissions of the developing countries as a whole, then in 2004 we find that these countries (including China and India) emitted only 41 percent of the world’s emissions although they constituted 80 percent of the world’s population. The world’s wealthiest 20 percent thus cause 60 percent of the world’s current annual emissions. The polluter pays principle would thus allow China and India to develop. Consider now a second principle – an ability to pay principle. This, too, would ascribe the largest portion of the burden to members of the industrialized world. So, on the basis of this very cursory and necessarily truncated examination, we can see that on any plausible account of moral responsibility the duty to

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81 Proponents of the development challenge might then argue that greater economic development will ensure adequate adaptation. This takes us back to the first challenge raised and the problems I noted with it.

82 The case is well made by Henry Shue, “Global Environment and International Inequality,” *International Affairs*, 75, 3 (1999), pp. 511–544. Shue considers three separate rationales and shows that they all lead to the same conclusion: industrialized economies should foot the bill for combating climate change.


84 Michael R. Raupach, Gregg Marland, Philippe Ciais, Corinne Le Quéré, Joseph G. Canadell, Gernot Kööpper, and Christopher B. Field, “Global and Regional Drivers of Accelerating CO₂ Emissions,” Proceedings of the National Academy of Sciences, 104, 24 (2007), p. 10392. This article also finds that developing countries and the least-developed countries are only responsible for 33 percent of total emissions since the Industrial Revolution (p. 10392).

mitigate does not preclude the needy from developing (either simply because the needy are the least able to pay or because the needy have not caused the problem).

A critic might respond to the last argument that this shows that (A) and (B) are jointly satisfiable in theory but, they add that, in practice, the two will collide. They will clash because some, probably very many, will not comply with their duty to mitigate and so others then face the choice between either, on the one hand, acting so as to prevent dangerous climate change or, on the other hand, furthering their own development. Now it is hard to gainsay the empirical assumption made by this objection. High emitters, like the USA, show no sign of complying with their duties. However, this does not unsettle the arguments of this chapter. For the focus of this chapter is on how energy rights should be distributed. One can answer this even if it is the case that we know that some are not doing their bit. That some are not adhering to their duty to cut their own energy use does not entail that the project is somehow misconceived for we still need to know (a) how energy rights should be distributed in principle. It is just that, in the face of noncompliance, we now need also to ask (b) how should some respond if others use more than their fair share of energy rights?

A third point bears noting, namely that the development challenge presupposes that development must take the highly industrialized path adopted by the West but there is no necessity for it to do this. If we conceive of development as the promotion of human interests, then industrialization is one way of furthering these, but it is not the only one.

We are left then with the problem identified earlier. There is a need to limit the concentration of greenhouse gases in the atmosphere and thus a need to fix an upper limit on the amount of greenhouse gases that we, the current generation, emit. A number of different kinds of policy instruments have been proposed to lower the concentration of greenhouse gases in the atmosphere. It is common to distinguish between (i) price restrictions (e.g., carbon taxes), (ii) quantity restrictions (e.g., place a cap on how much people can emit carbon), and (iii) regulations (e.g., insist on certain standards for buildings or vehicles). These all concern people's energy rights. In what follows, I am going to assume that the appropriate tool involves a system of carbon permits with trading. It would be possible to think of the fair distribution of emission rights by using taxes – those with a lesser right to emit greenhouse gases could be subject to higher taxes and there could be tax exemptions on those with greater rights to use greenhouse gas-intensive products. Nonetheless, for simplicity's sake (and because many political systems have adopted or are planning to adopt emissions trading schemes
rather than carbon taxes) I shall discuss the distribution of emissions in terms of the distribution of tradeable emissions permits.

Before doing so, it is important to stress that mitigation does not simply concern people’s energy rights. A successful mitigation policy might also include various other components including, for example, (i) incentivizing research into the development of clean technologies and the transfer of these technologies to developing countries, (ii) facilitating carbon capture and storage, (iii) using education to encourage environmental virtues, (iv) using “carbon disclosure” and utilizing people’s concern for their reputation and social standing to encourage people to lower their own emissions, and (v) developing carbon sinks. So, mitigation involves much more than the distribution of energy rights. Nonetheless the latter is one key component and worthy of exploration in its own right.

I WHO SHOULD OWN ENERGY RIGHTS?

The fair distribution of energy rights raises at least two separate questions. First, who should be allocated rights to use fossil-fuel-intensive energy sources? What kinds of entities are the rights-bearers? Is the right to emit greenhouse gases to be held by individuals, or firms, or states, or some other entity? A second key question is: How should rights to emit greenhouse gases be distributed? Should they be allocated equally or according to some other distributive criterion?

Let us consider the first question. Rights might be distributed to states, or to firms, or to individuals. Many who write about the allocation of emissions assume that states are the rightful owners of emission rights. Michael Grubb, to take one prominent example, once held that governments should each be allocated a set of permits to use greenhouse gases and they can then choose to use this permit or to sell it to other states.17

A system of carbon trading in which states possess rights to emit greenhouse gases and can buy and sell them is, however, potentially very unfair. Such a scheme would, in principle, allow an unscrupulous government (or group of politicians responsible for buying and selling carbon permits) to abuse this position in several ways. Consider two possibilities. First, under such an arrangement, a government could sell the emission rights that some of its citizens might desperately need to members of another state and pocket the revenue. Second, the government could distribute these rights

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to some citizens but not to others of that state (members of a disfavored ethnic group, for example). Without the right to emit greenhouse gases, their ability to support themselves may be severely compromised. Ascribing the right to emit greenhouse gases to states may thus be unfair toward the members of those states. 18

Someone who is motivated by the argument of the last paragraph might prefer a more individualistic option. Some have argued that the right to emit greenhouse gases should be distributed to individuals. There are, at least, two different ways of doing this. First, some have proposed a system under which individuals own personal carbon accounts (PCAs) and would have to use these when purchasing carbon-intensive products (gasoline, say, or a plane flight). Individuals are, in effect, given ration cards and can either use them or sell some of their quota to others. This kind of approach has been canvassed by many and, in 2007, was endorsed by the then British Minister for the Environment, David Miliband. 19 A second kind of individualistic approach adopts what has been called "cap and share." 20 Under this scheme, firms which emit greenhouse gases are required to buy permits in order to do so. However, the permits to emit greenhouse gases are allocated (equally) to individual citizens. Each individual is at liberty to sell their permit to a bank, which will in turn sell them to those firms that wish to buy the permissions necessary for the amount of greenhouse gases that they wish to emit.

Such individualistic approaches have a precedent. As proponents of such schemes note, this is a form of rationing, and rationing has been common during times of war. One issue concerns the scope of such schemes. It is possible to envisage such a scheme working within a nation state. However, it is highly utopian to think that this could be applied on a transnational, let alone a global level. So, although such an individualistic scheme might be applicable, it cannot constitute a comprehensive approach to energy rights.


20 For details see www.capandshare.org/. See, in particular, the document on "How Cap and Share Works," www.capandshare.org/howitworks.html.
Thus far, we have considered "states" and "individuals" as the possible rights-bearers. As we shall see later, there are other possibilities (Section 5). At this point, however, it is appropriate to turn to the question of which distributive principle should be applied to energy rights.

2 DISTRIBUTIVE CRITERIA – GRANDFATHERING

How should energy rights be distributed? In practice, many schemes adopt "grandfathering." This holds that the distribution of emission rights should reflect the distribution of emissions now or at some fixed point in the recent past. Heavy emitters would be awarded larger emission rights and those with small emissions would be awarded less. So the USA and European countries would be heavily favored by this scheme. How would members of countries like China or India fare? It is common to think that these two, especially China, are high emitters and, therefore, that they, too, would benefit. This perception is, however, misplaced once we examine the emissions per person in such countries. To adopt grandfathering is to adopt an approach which will give greater emissions rights per person to Americans and Europeans than to those from China or India.

I shall not discuss "grandfathering" at any length. As a matter of justice, it has very little, if anything, to recommend it. It rewards people in accordance with their contribution to the creation of a problem and that seems perverse. Many people have a deep and strong commitment to the polluter pays principle. If someone creates an environmental hazard, then, other things being equal, we expect them to remedy that situation. If, however, we accept this, then we have good reason to reject grandfathering for the two are diametrically opposed. Instead of saying the polluter should pay, grandfathering dictates that the polluter should be rewarded! Far from being required to pay for the problem created, it says that they should get preferential rights. This is clearly perverse.

In addition to this it bears observing that grandfathering is at variance with other morally relevant criteria such as how needy people are. It is, for instance, indifferent as to whether people require emissions to function at an adequate level. So it may distribute enormous rights to those who have no need of them and very few, perhaps none, to some who are in desperate need.

The only case for accepting grandfathering is a pragmatic one – namely that it should be adopted at the start of trading scheme to get major emitters to take part and sign up to the scheme, with a view to then altering it over
of what it is that people should have equal shares of. Ronald Dworkin, for example, famously thinks that there should be equality of "resources"; Amartya Sen canvasses equality of "capability to function"; Richard Arneson once canvassed equal "opportunity for welfare"; and G.A. Cohen defends equal "access to advantage." They share the view, however, that no person should be disadvantaged because of factors beyond their control. Now Gossereys both affirms his commitment to luck egalitarianism and then maintains that luck egalitarianism entails equal per capita emissions. It is on this basis that he maintains that "there is no reason for a Chinese or a Peruvian not to have a right to emit CO₂ equal to that of a Canadian or a Hungarian."

This argument, however, fails as a defense of equal per capita emissions because on each account of "equality of what," carbon emissions would form only part of what it is that people should have fair shares of, and there is no reason to affirm equality of each individual component part of the total package. For example, a resource egalitarian will favor equality of an individual's set of all resources — where this would include the use of their talents and the use of external resources (including, but not restricted to, the use of fossil fuels). Similarly, someone who adheres to Cohen's equality of access to advantage will wish to equalize each person's combined bundle of advantages, not every single ingredient that goes up to make up their access to advantage. Gossereys' defense of equal per capita emissions is thus vulnerable to the objection leveled above — namely that luck egalitarians are not necessarily committed to equality of each individual component of a collection of goods. An equal per capita approach would not follow from, or be endorsed by, any luck egalitarian metric.

Gossereys dissents from this line of reasoning and explicitly affirms what he, following Jon Elster, terms a "local justice" approach, where this holds

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104 For a fuller discussion, see my "Equality in the Greenhouse" (unpublished) and Bell's instructive analysis in "Carbon Justice: The Case Against a Universal Right to Equal Carbon Emissions."
that particular distributive principles should apply to different goods. Why should we adopt a local justice approach for greenhouse gas emissions? Gossner offers two replies. His main point is that, from a "methodological" point of view, it is better "to clarify things at this level first, before getting involved in a more complex 'all-things-considered' enterprise." To say, however, that we should "clarify things at this level first" (emphasis added) requires an argument showing why this level is an appropriate or natural one. Why is "the emission of greenhouse gases" the right level to focus on? Consider someone who said that each person should have rights to equal per capita emissions of methane, equal per capita emissions of nitrous oxide, equal per capita emissions of carbon dioxide, and so on. That would seem highly implausible. What is the point of disaggregating the greenhouse gases at this level? None. This is clearly not the right level at which to focus. Suppose then that someone says that each person should have equal per capita emissions of greenhouse gases (as a whole). Is this the right level? Again, it is not clear why.

To see why, it is useful to take a step back from this issue and ask why we should care about people's ability to engage in activities which emit greenhouse gases, such as carbon dioxide. The answer is surely that we care about this because we care about people being able to do things such as (i) heat themselves and keep warm, (ii) cook, (iii) construct buildings, (iv) travel from one place to another, (v) use technology for recreation and to communicate with one another, and, no doubt, many other activities and goals. Now underlying these "intermediate" interests are some more fundamental or basic interests. Of course, people may differ about what these fundamental interests are. Some might say, following John Rawls, that there is a higher-order interest in being able to form, revise and rationally pursue a conception of the good. On this basis they might say that goods like (i)-(v) matter because they serve this more basic interest in choice and revisability. Others might say that the basic interest is well-being and then

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55 "Cosmopolitan Luck Egalitarianism and the Greenhouse Effect," p. 283. His second reason is a more strategic one. The thought is that it might be politically advantageous to divorce this issue -- the causes and consequences of climate change -- from other issues of global economic, political, and cultural justice because one is more likely to be able to persuade people to take action on the climate change issue on its own than on a total package of global justice. The assumption here is that climate justice requires less dramatic action than global justice as a whole would (p. 283). Whether it would be politically astute to treat greenhouse gases and climate change separately from other aspects of global injustice is beyond my remit here. See, however, my "Equality in the Greenhouse?"

argue that (i)--(v) matter because they serve this basic interest. A third view might hold that persons have both an interest in well-being (and thus in keeping warm, preparing food, and using technology) and an interest in autonomy (and thus in being able to move from one place to another at one's own convenience). We do not need to arbitrate between these three (or any other) accounts of persons' fundamental interests. The key point here is that the interest in being able to engage in activities that emit greenhouse gases has significance because it furthers some more fundamental human interests. One can go further. Indeed one might say that the interest in being able to engage in activities which emit greenhouse gases has significance only if it contributes to some more fundamental interests. Suppose, for example, that persons do not need to use energy sources that emit high levels of greenhouse gases then and suppose further that there are other reasonably priced energy sources. In these circumstances, then -- especially given the harmful nature of greenhouse gas emissions -- it is hard to see why persons would have an interest in using greenhouse gas-emitting energy sources at all. If this is true, then we can say that persons can have an interest in using carbon-intensive practices if and only if this is necessary for some higher-order interest.\footnote{This point is also persuasively made by Tim Hayward in his illuminating "Human Rights Versus Emissions Rights: Climate Justice and the Equitable Distribution of Ecological Space," \textit{Ethics and International Affairs}, 21, 4 (2007), especially pp. 443--444. See also Miller, "Global Justice and Climate Change: How Should Responsibilities be Distributed?" especially p. 142. I develop the point further in "Equality in the Greenhouse."}

Now how is this relevant? The answer is that if it is the case that the ability to engage in carbon-intensive activities has value only because it contributes to some general basic interest, then we should not treat that ability in isolation from all the other phenomena that also serve this basic interest. All of these phenomena (whether it is the opportunity to engage in carbon-emitting activities or the opportunity to have health care, or the opportunity to have material support in times of need) have value as contributors to some higher-order interest. The emission of greenhouse gases thus derives its importance simply from being one element in a vast system of elements which jointly serve higher-order interests. There is, therefore, absolutely no reason to sing it out for special treatment, and to focus on carbon emissions (or even greenhouse gas emissions) is to focus at the wrong "level." Put more succinctly: the arguments for attributing normative significance to greenhouse gases emissions entail that the latter should not be attributed according to their own distributive principle.
The charge then remains. There is no reason to treat the distribution of greenhouse gas emissions separately from an understanding of their moral general entitlements. Therefore the equal per capita perspective is implausible.

3.2 Objection 2

I want now to press a second objection to carbon egalitarianism. This second objection starts with the observation that the equal per capita view is a kind of resourcism. That is, it holds that (in the case of climate change) justice requires the distribution of a fair share of a specific sort of resource, where the resource in question is that of being able to engage in carbon-intensive activities. Everyone should have a fair, understood as equal, share of the Earth’s carbon budget: they all have the right to consume the same amount of carbon.

Now, as such, the equal per capita view is vulnerable to the objections standardly leveled against resourcism. In particular, it is vulnerable to Amartya Sen’s objection that resourcism is guilty of “fetishism.” Resources such as wealth and income are means to an end or set of ends. It is therefore misconceived to focus one’s concern on the means as if it they were what ultimately mattered. To do so is to give them a status that they do not deserve. Justice should instead, on this view, be concerned with what people are able to do and whether people are actually capable of achieving certain goals.\(^{58}\) To see the force of this objection, focus on the permission to emit a certain amount of carbon dioxide. This matters only insofar as it enables one to do certain things – like travel or heat oneself. In itself it has no value and so if it were substituted by another energy source that achieved the same outcomes at the same price there could be no legitimate complaint.

Note that this objection is distinct from the first one, for one can press the first objection without rejecting resourcism. The problem highlighted by the first query is that of singling out one good/resource for special treatment. The problem highlighted by the second query is that of why we should think that justice requires focusing on “resources.” Someone committed to global resource egalitarianism would agree with the first objection but not the second.

3.3 Objection 3

Let us turn now to a third, related problem with the egalitarian proposal. This problem follows on from the last but gives it a more specific content.

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The worry is simply stated: namely that granting people equal emission rights is unfair when some need more emission rights than others. The equal per capita view, the argument runs, is defective because it is indifferent to people's different needs and vulnerabilities. There are a number of different ways of fleshing out this objection. Consider, for example, the following scenarios:

Example I: The case of the needy
Compare, on the one hand, the plight of the elderly and the extremely young who live in a freezing climate with able-bodied people living in warmer climes. The former have greater health needs than the latter. Here, an equal per capita view is very harsh on the needy, the poor and those suffering more generally from fuel poverty.

This example illustrates and develops Sen's argument introduced above because it draws attention to the fact that we are not concerned with resources per se but with what we can do with them and in this case equal emission rights do not entail equal ability to further key interests.

Consider now a second case:

Example II: The case of unequal energy sources
Compare two societies. The first has easy access to non-carbon-intensive energy sources, including, for example, renewable energy sources like wind power (and, one might add, nuclear energy). The second, however, lacks access to renewable energy. It is not windy there and it does not have the mountain streams that the first can use to generate hydroelectric power. (We might suppose, too, that it is in an earthquake zone and so cannot build nuclear power plants.) Now to ascribe the members of these two societies equal rights to emit carbon dioxide is to be insensitive to a morally relevant difference—namely that some need to use carbon more than others. They need to because they have less opportunity to use other energy sources.

Examples I and II thus both show that an equal per capita view is unfair on those with greater needs—whether they have greater needs because of the

59 The same concern is raised by Miller, "Global Justice and Climate Change: How Should Responsibilities Be Distributed? Lecture 2." For an empirical study of the correlation between emissions and geographical factors, see Eric Neumayer, "National Carbon Dioxide Emissions: Geography Matters." Area, 36, 1 (2004), pp. 33-40. Neumayer finds a strong correlation between (i) emission levels and the coldness of the climate, and between (ii) emission levels and the opportunity to use renewable energy sources. He also finds a weaker correlation between emission levels and normal transportation costs. Interestingly, Neumayer recognizes that these correlations undermine the fairness of an equal per capita view (p. 39).
kinds of environment they live in or whether they have greater needs because of the lack of other energy sources.

Some might resist this line of reasoning. Consider two counter-arguments.

First, Gosselies discusses those with more needs than others—including, for example, those who need more fuel to heat their houses because they live in cold climates and those who need more energy to travel because they live in an area where the population is dispersed. He argues, however, that, as time progresses, we are entitled to ignore these greater health needs because they are no longer part of one’s “circumstances” but reflect their “choices.” People could choose not to live in sparsely populated areas where they “have” to travel to get basic amenities, and they could choose not to live in cold climates. And since they can choose to do so, they are not entitled to the extra support from others.

But this counter-argument encounters some serious problems. Most obviously, some will have needs which they cannot alter through their own choice. In some cases this will arise because of physical factors: Those who are weak and infirm and who need more electricity to heat themselves cannot simply choose to be strong and healthy. In other cases, the disadvantage will stem from financial factors: The elderly pensioner living in an inhospitably cold environment may be too poor to move to warmer climes. And in some cases, the disadvantage will arise from political-legal factors. Consider again those living in freezing climates. They may be unable to migrate to a warmer country because of immigration restrictions. There are thus physical, financial, and political factors which entail that some of those with greater needs cannot be said to have chosen to have those needs.

The objection, thus, remains intact: Equalizing the right to emit carbon dioxide is unfair on those with greater needs.

Consider now a second argument that might be made. This second argument draws on a response made by Peter Singer to this problem. In One World, Singer considers the observation that Canadians might need more resources than some (Mexicans in his example) because of the cold winters they endure. Singer’s response is not to call for a more-than-equal allocation of emission permits to those with more needs but to say that this problem is taken care of by making the permits tradeable.

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61 One World, p. 47.
then buy their permits from elsewhere. But this response is unsatisfactory. In the first place, some people may not be able to buy a sufficient number of permits. Consider, for example, economically disadvantaged Canadian citizens. Or, more generally, it might be useful to change the example from contemporary Canadians (whom one might imagine to be well off) to poor Russians or Poles or Siberians. Second, even if a needy person can actually afford to pay for sufficient carbon permits to heat herself, this ignores the bigger picture: namely that under a scheme which allocates everyone the same quota of carbon emissions she is relatively worse off than an able-bodied person. Carbon egalitarianism leads to inequality in one’s ability to pursue one’s goals and aspirations. As such, the scheme penalizes the disadvantaged even if it is the case that the disadvantaged can buy permits to cover their most basic needs.

The third objection thus stands. The equal per capita view is unfair on the needy and vulnerable. It is perhaps worth noting here that when rationing schemes have been introduced in the past they have often recognized this point. For example, as Ina Zweiniger-Bargielowska documents in her fascinating book on rationing in Britain in World War II and the postwar period, extra rations were allocated to some who were perceived to be especially needy. Furthermore, she reports that where there were flat rate equal allocations of goods these were often regarded as unfair. For example, the overwhelming majority of male manual workers argued that a system of equal food rations was unfair because it did not reflect their greater need for nutritious food.

4 MEETING VITAL NEEDS AND ENABLING DEVELOPMENT

The analysis so far has been critical. I have rejected two approaches to distributing greenhouse gas emission rights. In this section, I wish to draw attention to a third, more promising, possibility. This third approach builds on the objections leveled against the two preceding approaches. More precisely, it starts from the objection that both the egalitarian approach and grandfathering are insensitive, in different ways, to people’s basic needs.

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63 Note that Singer concludes by saying that “[t]he claim of undue hardship therefore does not justify allowing rich countries to have a higher per capita emissions quota than poor countries” (One World, p. 47). This is true but does not deal with the claim of undue hardship suffered by the disadvantaged.

64 Ina Zweiniger-Bargielowska, Austerity in Britain: Rationing, Controls, and Consumption, 1939-1955 (Oxford University Press, 2000), p. 15, footnote 33. Zweiniger-Bargielowska adds that Germany’s rationing system was more accommodating to people’s different needs than Britain’s (p. 38).

65 Ibid., pp. 76 and 262. The reason that the proposal to distribute greater food to those with physically demanding jobs was resisted was, it seems, a purely practical one (p. 17).
Clearly the egalitarian approach is more sensitive to this concern but it, too, I have argued, does not take sufficient account of people's needs, and in particular the differing levels of needs between different people. Drawing on this one might then propose that, as a minimum condition of a fair world, the right to emit greenhouse gases should be distributed in such a way that people can enjoy what Henry Shue terms "a minimally decent standard of living."\(^{65}\) Domestically this requires distributing emissions to those in fuel poverty who need more energy to satisfy their core needs. At the international level, this means distributing emission rights in such a way that one enables the development of the world's poor and disadvantaged in ways which do not trigger dangerous climate change.

It is important to note here that there are two quite different ways of achieving the core moral ideal affirmed by this third approach. One involves distributing greater emission rights to the most disadvantaged. A second proposes auctioning emissions permits and then distributing the proceeds to the disadvantaged. The first kind of approach is advanced by Paul Baer, Tom Athanasiou, and Sivan Kartha. They advocate what they term the "greenhouse development rights" approach.\(^{66}\) As its name suggests, this proposes distributing emission rights in such a way as to enable the poor of this world to develop while also limiting the total volume of emissions so as to ensure that it does not exceed a dangerous level. It would thus grant extra emission rights to the most disadvantaged so that they can realize the right to develop.

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For concerns about how one could adequately specify the appropriate standard of living, see Stephen Gardiner, "Survey Article: Ethics and Global Climate Change," *Ethics, 114*, 3 (2004), pp. 879–896. For some thoughts on how to address this kind of concern, see Caney, "Human Rights and Global Climate Change," in *Cosmopolitanism in Context: Perspectives from International Law and Political Theory* (Cambridge University Press, 2010), edited by Roland Pierrek and Wouter Werner, pp. 43–44.

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The second kind of approach has been canvassed (in different ways) by Peter Barnes and Oliver Tickell. They call for a scheme with three distinctive features. First, permits to emit greenhouse gases should be distributed via a regular (e.g., annual) global competitive auction. Firms bid against each other for these permits and the permits are distributed to the highest bidder. Second, the volume of greenhouse gases to be emitted declines over time in order to prevent the concentration of greenhouse gases from reaching unacceptable levels. Third, the proceeds of the auction can then be spent on just causes—either to combat dangerous climate change (the narrow version) or to further global principles of economic and environmental justice (the wider version). The key feature of this approach is that it seeks to achieve equity not by focusing solely on the distribution of emission rights but by focusing on both (a) the revenues raised by the emissions auctions and (b) the principles according to which rights to emit are allocated.

Note that one might combine these approaches. Where an upstream auction is already in place (as it will be in the European Union) it might make sense to continue to use an auction approach but to reform it so as

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Finally, one might note here a comparison with Article 10 of the new directive passed by the European Commission on January 22, 2008. The latter proposes that at least 20 percent of the revenues raised in the reformed EU Emissions Trading Scheme should be spent on encouraging renewable energy sources (clause b), CCS (clause c), paying people, especially those in the least-developed countries, not to engage in deforestation (clause d), and adaptation (clause e). See http://ec.europa.eu/environment/climatemisssion/pdf/com_2008_16_en.pdf.

68 It might be worth noting that the proposal made in the text has affinities with some existing schemes. Consider, in particular, the Alaskan Permanent Fund (a scheme under which a proportion of the revenues from the sale of oil and gas in Alaska is disbursed to all Alaskan citizens in the form of an annual dividend). For details about the Alaskan Permanent Fund see Jonathan Anderson, “The Alaska Permanent Fund: Politics and Trust,” Public Budgeting and Finance, 22, 2 (2002), pp. 57–68. Comparisons might also be made to Thomas Pogge’s Global Resources Dividend (which levies a small dividend on the use of natural resources and then disperses that globally). See Pogge, World Poverty and Human Rights: Cosmopolitan Responsibilities and Reforms (Cambridge: Polity, 2008), and edn., ch. 8.
best to enable the realization of key interests. In other contexts, the first kind of approach may be more suitable.69

Now both of these schemes can be designed in ways which enable people to satisfy their most fundamental needs and which allow the poor to develop. This is particularly clear in the case of the greenhouse development rights scheme, since it is of the essence of this approach that it distributes emission rights so that the disadvantaged can enjoy a right to develop. It is less clear in the case of the auction-based approach. Some might worry that the auction is unfair on the global poor for they and their firms will not be able to afford to bid for global emission rights. Three points are worth stressing in reply. First, this objection has most force when the auction is held for the first time. However, it is important to stress that the proceeds of the auction can be dedicated to the needs of the most vulnerable. They will benefit in absolute terms from the sale of auctions and are certainly better off than they are under the status quo.70 Moreover, one might propose, as Peter Barnes and his co-authors (who include the 2009 Nobel Laureate for Economics, Elinor Ostrom) do, that half of the proceeds of the auction should be distributed in the form of an annual lump sum to everyone. They argue that if each tonne of carbon dioxide equivalent is auctioned at a price of $20 to $80, then this will yield a revenue of $0.9 to $3.6 trillion dollars a year, which would in turn result in an annual dividend of $71 to $285 per head.71 Alternatively one might decide (a) to devote more than 50 percent of the auction revenue to this kind of annual dividend, and one might also (b) distribute it wholly to the world’s poor and not on an equal per person basis. A key point is that by the time of the second auction the purchasing power of the world’s disadvantaged will be augmented, and it will be improved further in each successive auction as long as resources are diverted to the most vulnerable. Second, one may simply stipulate that certain kinds of activities (needed to cover one’s most basic needs) should not be part of the auction. In this way one could ensure that the global poor are not disadvantaged. Finally, if neither of these two responses proves adequate one could, of course, alter the auction to ensure that a certain quota of emission rights is set aside for developing countries. These three points, I believe, should dispel any concerns that the scheme being proposed is harmful to the global poor.

Note that neither the distribution of emissions nor the auctioning of emissions is likely to be sufficient to mitigate climate change. Four other

69 For another way of combining the two methods, see Beckerman and Pauck, Justice, posterity, and the Environment, p. 84.
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means merit mention. First, governments can employ regulations to lower greenhouse gas emissions. They can, for example, stipulate that new buildings meet certain standards of insulation. They can also prohibit the use of some particularly powerful greenhouse gases. Second, governments can use carbon disclosure programs to motivate people to lower their emissions. People care about what others think of them and often avoid some courses of action for fear of the stigma and public disapproval attached to those courses of action. Consider, for example, the stigma attached to drunk driving. Now governments may employ this strong desire in an attempt to lower emissions. If, for example, they require firms to disclose how much greenhouse gas they emit and how much greenhouse gas was emitted to produce each product, then (a) firms may lower their emissions for fear of the stigma attached to high emissions. In addition to this (b) individuals may wish not to be seen to consume goods with a large carbon footprint. Obviously this kind of measure succeeds only where there is social disapproval of high emissions and this is a considerable limitation. However, where there is such an ethos, carbon disclosure can exert a powerful effect on human behavior. Third, governments may seek to develop and implement carbon sequestration – either capturing carbon dioxide as it is emitted or by trying to capture it from the air. Fourth, governments can, and should, foster the development and transfer of new clean energy sources. This is important to enable the global poor to develop without bringing about dangerous climate change.

Each of these measures can, and should, be designed to mitigate climate change and, crucially, should be designed to do so without compromising people's capability to attain a decent standard of living.

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72 See on this the interesting discussion by Richard H. Thaler and Cass R. Sunstein, Nudge: Improving Decisions about Health, Wealth, and Happiness (New Haven, CT and London: Yale University Press, 2008), pp. 188–191. For an illuminating discussion of the mechanism under consideration, see Geoffrey Brennan and Philip Pettit's excellent The Economy of Esteem: An Essay on Civil and Political Society (Oxford University Press, 2004). One final point bears noting here. Carbon disclosure may have an additional benefit noted by Sunstein and Thaler. Individuals care not simply about how they appear to others but also how they appear to themselves. They may want to be good green citizens. Policies that reveal to people just how much energy they are consuming may thus result in lower emissions. As Sunstein and Thaler rightly observe, how much greenhouse gas an activity produces is to a large extent “invisible” (Nudge, p. 104). Given this, as long as people care about having lower emissions, then increasing their visibility will encourage lower emissions. See Nudge, pp. 193–194.

5 THE PLACE OF EQUALITY

Earlier in this chapter I criticized one specifically egalitarian analysis of global climate change. I now want, in this section, to draw attention to several ways in which equality can, and should, feature in our understanding of the problem of climate change. Three points in particular are worth making.

First, and obviously, the position developed here is quite compatible with defending an egalitarian approach to the distribution of burdens and benefits at the global level. Indeed this chapter is motivated by a commitment to global equality – the point is simply that global equality does not entail an equal per capita approach. So to apply this point to the global auction outlined in the preceding section, one might argue that the proceeds should be spent so as to minimize existing global inequalities.

Second, it bears noting that fair climate policies require a more egalitarian distribution of power. International negotiations on climate change, as well as those on trade and development, are marked by inequalities of power. There are at least two different aspects to this. First, wealthier economies have far greater bargaining power and can threaten to withhold benefits. Second, wealthier countries are able to send a large and well-informed negotiating team to climate negotiations whereas many less developed countries cannot afford to do so. The latter are thus less able to defend their interests. Global inequalities thus lead to inequitable climate negotiations. This makes the reform of international institutions (to even out countries’ influence) and, more generally, the more equal distribution of wealth matters of paramount concern.

Third, it is important to recognize that the earlier critique of an equal per capita critique does not preclude one from condemning the fact that some citizens of the world (notably North America and Europe) have emitted far more greenhouse gases than others (those from China, India, and Africa). At first glance, one might think that one cannot both condemn the existing inequalities in emissions and make the argument I made earlier against an equal per capita view. This, however, is clearly mistaken. My arguments earlier show, if correct, that inequalities in emission rights are not in principle objectionable if those with fewer emission rights have commensurately more goods in other domains to make up for their shortfall in emissions. But in

74 J. Timmons Roberts and Bradley C. Parks, A Climate of Injustice: Global Inequality, North-South Politics, and Climate Policy (Cambridge, MA: MIT Press, 2007), pp. 14–19. Roberts and Parks’ emphasis is, however, on another aspect of global inequality – namely how global inequalities lead rich and poor countries to lack a common perspective on global climate change and to distrust each other.
our world they clearly do not. The citizens of Africa or India or Bangladesh or China are all low emitters in per capita terms and among the poorest people in the world in terms of their possession of other goods. The existing emissions inequalities are thus part of an objectionable inequality.

6 CONCLUDING REMARKS

There has been relatively little sustained analysis of climate change by political philosophers – though that is now, thankfully, changing. One important question that arises is how energy rights should be distributed. In this paper I have criticized several prevailing ways of thinking about this – some favored by political and business elites (grandfathering) and others favored by environmental activists (equal per capita emissions). Neither approach is, I have argued, adequate.

In the course of so doing, I have made a methodological claim and a substantive claim. The methodological claim is that it is a mistake to try to create a theory of justice that takes as its sole subject the fair distribution of carbon emissions. One should not have a theory of greenhouse gas justice (any more than a theory of aluminum justice or titanium justice). It is better to create a theory of justice that, inter alia, governs the emissions of greenhouse gases. In addition to this methodological point, I have endorsed an approach which is committed to meeting core needs and have drawn attention to two different ways of realizing this ideal. It may be that it, too, is subject to powerful objections, in which case, I call on others to develop it further or to show how an alternative is superior.