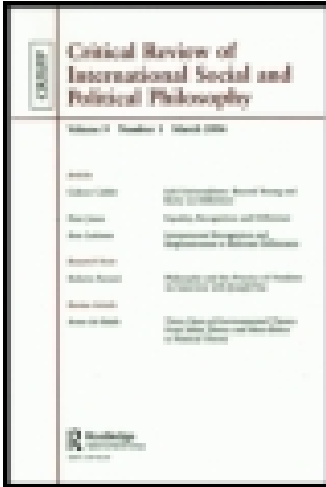


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### Climate change and the duties of the advantaged

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## Climate change and the duties of the advantaged

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Climate change poses grave threats to many people, including the most vulnerable. This prompts the question of who should bear the burden of combating 'dangerous' climate change. Many appeal to the Polluter Pays Principle. I argue that it should play an important role in any adequate analysis of the responsibility to combat climate change, but suggest that it suffers from three limitations and that it needs to be revised. I then consider the Ability to Pay Principle and consider four objections to this principle. I suggest that, when suitably modified, it can supplement the Polluter Pays Principle.

**Keywords:** climate change; duties; polluter pays principle; ability to pay principle

It is widely (though not universally) acknowledged that the earth's climate is undergoing profound changes and, moreover, that these changes are, to a large extent, the result of human activity. These changes are predicted to have profound and undesirable effects on people's standard of living, including most notably the standard of living of the most vulnerable and weak. The ill effects will include raised sea-levels which, in turn, destroy habitable land, human settlements and infrastructure. They will, in addition, expose some to greater risks of 'storm-surges'. The increased global warming will induce other malign effects, including higher deaths from drought and malnutrition. In addition to this the increased temperatures will increase the numbers of those exposed to infectious diseases, such as malaria, dengue and cholera. Higher temperatures will also result in death by heat stress. Climate change will, moreover, bring increased rainfall for some areas and this too will issue in harmful effects, causing destructive flooding. Finally, the majority of scientific experts hold that climate change heralds unpredictable weather events and such freak events will threaten human buildings and infrastructure.<sup>1</sup>

This raises the question of who should bear the burdens of dealing with climate change. One can identify at least two principles:

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- those who caused the problem should pay (the Polluter Pays Principle – PPP);
- those who have the greatest ability to pay (the Ability to Pay Principle – ATP).<sup>2</sup>

Many discussions focus on the Polluter Pays Principle.<sup>3</sup> In what follows I want to chronicle some of its limitations and argue that a version of the Ability to Pay Principle must play a crucial role.

Before doing so, it is worth clarifying what I mean by ‘bearing the burdens of global climate change’. We can distinguish between (at least) two different kinds of duty. First, one might say that there is a duty to cut back on activities which cause climate change. To use the language employed by the Intergovernmental Panel on Climate Change (IPCC), this duty requires people to engage in ‘mitigation’. The duties involved would include, for example, a duty to reduce emissions of greenhouse gases (where these include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6)). It would, in particular, require cutting back emissions of carbon dioxide. In practice, this would require persons to adopt policies such as reducing air travel, driving less, insulating one’s house more efficiently, using less electricity, and so on. The duty to prevent further climate change could also comprise creating and protecting carbon sinks. Let us call this first kind of duty a ‘duty of mitigation’. A second kind of duty is the duty to devote resources to protect people from the ill effects of climate change. To employ the usage of the IPCC, this duty is a duty to facilitate and support ‘adaptation’ to climate change. Let us call this a ‘duty of adaptation’. This duty would involve spending money on the following types of activity: building sea-walls which will protect those who live and work near the coast from sea-level rise and from storm surges; subsidizing people to move away from threatened coastal settlements; spending more money inoculating people from infectious diseases; supporting irrigation systems in drought-prone areas; sending overseas aid to victims of malnutrition; and so on.

It is widely recognized that, whatever happens, some adaptation is required. The emission of greenhouse gases has reached such a level and has been taking place for such a long time (since the industrial revolution) that even if emissions levels were dramatically cut there would still inevitably be an increase in temperature and in sea-levels. As a recent statement of the national academies of science of 11 countries (including those of the USA, India, China, Germany and the UK) reports

Carbon dioxide can remain in the atmosphere for many decades. Even with possible lowered emission rates we will be experiencing the impacts of climate change throughout the twenty-first century and beyond. ... Major parts of the climate system respond slowly to changes in greenhouse gas concentrations.

Even if greenhouse gas emissions were stabilised instantly at today's levels, the climate would still continue to change as it adapts to the increased emission of recent decades.<sup>4</sup>

Furthermore, the distinguished scientist, Michael Mann, has recently stated that 'we're already committed to 50 to 100 years of warming and several centuries of sea-level rise, simply from the amount of greenhouse gases we've already put in the atmosphere' (Appell 2005, p. 23). Indeed recent research has found that '[s]ea level is likely to continue rising for more than 1000 years after greenhouse gas concentrations have been stabilised, so that with even a sizeable mitigation effort adaptation is also likely to be needed' (Lowe *et al.* 2006, p. 35). A policy of mitigation is, therefore, not sufficient.<sup>5</sup> To prevent climate change from jeopardizing the interests of persons some resources will be need to be spent on adaptation.

It is also widely, though not unanimously, accepted that a policy of mitigation is necessary and that one cannot simply rely on adaptation.<sup>6</sup> The need to engage in mitigation has been further underscored by the latest research. For example, recent studies have shown that the West Antarctic Ice Sheet (WAIS) and the Greenland Ice Sheet are both less stable than previously assumed and if these melt they will have severe and dangerous effects on sea-levels.<sup>7</sup> In addition, recent research has found that the Atlantic Thermohaline Circulation is under threat and if this shuts down this will have severe effects on human life.<sup>8</sup> There is, then, an urgent need for a reduction in greenhouse gas emissions to prevent further increases in the earth's temperature and increasing sea-levels. A full account of the duty to bear the burden of climate change must, thus, include both a duty to engage in mitigation and a duty to spend resources enabling persons to adapt to climate change.

Who should bear these burdens?

### **The 'Polluter Pays' Principle and two concerns**

Consider, first, the view that the polluter should pay. This has an immediate intuitive appeal and should play a role in any plausible account of who should pay the price for addressing climate change. It is a strongly held view that if an actor causes pollution (through, say, releasing radioactive waste or emitting dangerous fumes) then that actor is morally responsible for dealing with the ensuing costs to others. The Polluter Pays Principle is, note, a backward-looking or historical principle. Drawing on this principle, it follows that those who contribute to climate change (either by using up excessive amounts of fossil fuels or by deforestation) should make amends for this. If, for example, they have used excessive amounts of greenhouse gases then, *ceteris paribus*, it is fair to require them to cut back their emissions accordingly (and/or to devote resources enabling the potential victims to adapt to dangerous climate change). This approach has been canvassed by a number of developing

countries, most notably Brazil. In a proposal it submitted to the deliberations of the United Nations Framework Convention on Climate Change (UNFCCC) it argued that countries which had emitted more greenhouse gases should bear a greater responsibility in combating climate change.<sup>9</sup> This proposal was subsequently referred to the Subsidiary Body for Scientific and Technological Advice (SBSTA) and it seems unlikely to come into effect.<sup>10</sup> Our question, though, is whether the principle at heart is a valid one.

I shall argue that the Polluter Pays Principle should be supplemented by an additional principle, but before I do so it is important to consider two concerns that might be raised about the Polluter Pays Principle.

### **Objection 1**

One concern that might be raised about the Polluter Pays Principle concerns its practicality. A critic might emphasize the extent of uncertainty in climate science and draw attention to two factors in particular. (1) The first concerns the uncertain nature of the estimated ill effects. The projections of the IPCC, for example, reasonably enough, take the form of projecting that a phenomenon P will increase by between x% and y%. The Third Assessment Report estimates, for example, that between 1990 and 2100 sea-levels will rise by between 0.09 metres and 0.88 metres and the temperature will increase by between 1.4 and 5.8° Celsius (Ahmad *et al.* 2001, p. 3). In addition it regards some of its projections as more confident than others and employs a five-point scale indicating various degrees of confidence (ranging from 95% confidence to 5% confidence) (Schneider and Sarukhan 2001, p. 79). It is hard, then, to specify how much harm will result from this and hence difficult to make people pay in proportion to their causal impact on a problem. For further illustration of this problem consider the category of persons who are suffering from ‘water-stress’. On some projections, between 1.1 and 2.8 billion of these people will suffer further reductions in their access to water by 2050 and on other projections the estimate is that between 0.7 and 1.2 billion people will experience a decrease in access to water in this time period (Arnell 2006, p. 167). Estimating the extent of the harm caused by global climate change is therefore immensely difficult. (2) Consider now a second aspect. Take sea-levels again. Sir John Houghton reports that sea-levels are expected to rise by just under two metres by 2100 in Bangladesh, but he adds that without climate change there would be soil erosion anyway and only 70cm of this rise will result from anthropogenic climate change (Houghton 2004, p. 150). If this is so, we then need to ascertain what damage would result from a 70cm rise alone. To gain any non-arbitrary view here would seem to be next to impossible – yet, it is required to implement the Polluter Pays Principle. The key point is that to apply the Polluter Pays Principle we need to be able to specify the harm done and trace it back to the causal actors and where either the nature of the harm is uncertain or unpredictable (point

1) or the link between the climate change and the harm is uncertain (point 2) then this cannot be done.<sup>11</sup>

How serious is this problem? And how damaging is it to the Polluter Pays Principle? Three points can be made in reply. First, one might just reply that the preceding practical problems do not call into question, or undermine in any way, the moral force of the principle. What they reveal is that it is difficult to apply and in seeking to implement it we should be aware of the immense practical problems involved. In themselves, though, they do not establish that the principle is morally implausible. The lessons to be learned from the objection are, then, not that the principle should be rejected but that caution should be exercised when applying it and that we cannot hope for too much exactitude.

Second, it bears noting that climate modellers believe that they are making considerable progress in developing the capacity for the detection and attribution of climate change. Some are increasingly confident that it will be possible to attribute specific events to climate change.<sup>12</sup> For example, Peter Stott, Daithi Stone and Myles Allen have argued that one can attribute the heatwave that occurred in Europe in the summer of 2003 to human forcing (Stott *et al.* 2004).

Third, and finally, it is important to recognize that the problem does not only affect the Polluter Pays Principle. It affects it more acutely but actually all principles which ascribe duties for combating climate change are affected by this problem. To see why this is the case, it is useful to return to the distinction between the 'duty of mitigation' and the 'duty of adaptation'. Consider, first, the duty to fund adaptation. The Polluter Pays Principle is undoubtedly at a disadvantage when compared with alternative principles, such as the Ability to Pay Principle. This can be seen if we consider rising sea-levels again and ask who should finance the process of adaptation needed to ensure that rising sea-levels do not harm people's vital interests. The Polluter Pays Principle, *by its very nature*, must ascertain who caused how much harm and, as such, it must become embroiled in the complex historical problems noted above. It must do this to ascertain who the duty bearers are and the size of their duty. An Ability to Pay approach, by contrast, does not need to enquire into the causes of dangerous climate change in order to determine who should pay for the necessary adaptation. It need not get embroiled in issues surrounding the historical causes for climate change because all it needs to know are, first, what kind of adaptation measures are required and, second, who are the most advantaged. In light of this, a historical approach, like the Polluter Pays Principle, can, therefore, be said to be less practical than competing approaches such as the Ability to Pay Principle.

However, note that the problems of determining cause and effect also affect *all* principles determining who should bear the burdens of climate change. This can be seen if we consider the duty to engage in mitigation. The reason is straightforward: any account of the duty to prevent harms must

employ an accurate account of which activities cause those harms and by how much. So even if one adopts an Ability to Pay approach one needs to know the extent of the harms caused by dangerous climate change and what causes those harms. Performance of the duty to mitigate requires this knowledge. It is only once one has this information that one can then specify what the wealthiest must do to perform their duty to prevent dangerous climate change. So *any* theory concerned with preventing further harmful climate change cannot avoid the complex causal issues raised above. The problem is, therefore, not particular to the Polluter Pays approach and, as such, does not give us reason to reject that approach in preference to another one.

### **Objection 2**

Consider now a second challenge to the Polluter Pays Principle. One worry about applying the Polluter Pays Principle to global climate change is that some people were excusably ignorant of the fact that their activities may lead to dangerous climate change. As such it would be unfair to make them pay. They knew not what they were doing and, moreover, their ignorance is excusable.

A number of different counter-arguments might be made in response to this argument. One can identify at least five possibilities. These hold that the ‘excusable ignorance’ argument does not invalidate or limit the application of the Polluter Pays Principle to climate change because:

Reply (1): ever since the 1990s, it has been widely known that methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride cause climate change.<sup>13</sup>

Reply (2): ever since a pre-1990 date, it has been widely known that carbon emissions *might* cause climate change and agents should have acted according to the ‘precautionary principle’.

Reply (3): those responsible for emitting excessive amounts of greenhouse gases have continued to do so even when they have been made aware of the consequences of their actions so the fact that they were excusably ignorant before does not exempt them from being paying for the emissions that they generated when excusably ignorant.<sup>14</sup>

Reply (4): we should adopt a strict liability principle where this holds that if people engage in activities which jeopardize other people’s fundamental interests by emitting excessive amounts of greenhouse gases then they should bear the costs of their actions even if they were excusably ignorant of the effects of their actions (see Neumayer 2000, p. 188; Shue 1999, pp. 535–536).

Reply (5): we should adopt a modified strict liability principle where this holds that if people engage in activities which jeopardize other people’s fundamental interests by emitting excessive amounts of greenhouse gases, then they should bear the costs of their actions even if they were excusably ignorant of the effects of their actions if *they have benefited from those harmful activities* (see Baer 2006, p. 136; Gosseries 2004, pp. 40–41).<sup>15</sup>



Let us consider each of these responses. Reply (1) clearly has force now and from sometime in the last 15 or so years. However, its obvious limitation is that it cannot cover emissions that precede whatever cut-off date we specify as the date after which one cannot plead excusable ignorance. Given this, let us consider reply (2). This can reach further back into the past than reply (1) but it is hard to say with any specificity the date from which it can be applied. In addition to this, one important question that arises is whether persons who *had reason to think* that greenhouse gases *might* cause climate change should pay the same amount for the consequences of their action as persons who *knew* that greenhouse gases *did* cause climate change. Intuitively this seems wrong but then how much less should those who violate the precautionary principle pay? There is no obvious answer.

Consider now reply (3). Its thesis is that if people would not have cut back on their emissions even if they had not been excusably ignorant then the fact that they were indeed excusably ignorant does not exonerate them. Since they would have emitted just as much anyway, whether or not they were aware of the causes of climate change, their excusable ignorance is not germane: they are required to pay for their emissions. Now reply (3) is hard to dispute on empirical grounds. Those who have known about the effects of their carbon-intensive practices have not engaged in mitigation. Indeed emissions have continued to increase year after year. For example, carbon dioxide emissions stemming from fossil fuel use and industry have grown by more than 3% per annum during the 2000–2004 period (as compared to 1.1% per annum between 1990 and 1999) (Rapauch *et al.* 2007, p. 10288). One might, though, object to reply (3) on procedural grounds. Even if one had overwhelming reason to think that people would not have cut back on their emissions if they had known earlier and so would have acted wrongly, one is not entitled to treat them as if they have in fact acted wrongly. For they have not and it would be a violation of procedural justice to treat them as if they had. They should be given a fair chance to act correctly and reply (3) denies them this.

Given this one might adopt reply (4) and affirm a principle of strict liability. This, however, seems to me to fail to do justice to potential duty-bearers. Any compelling theory of justice must accommodate both the concerns of the rights-bearers (we wish that our rights be upheld) and the concerns of the duty-bearers (the duties entailed by the rights should not be unreasonable). However, an unqualified strict liability approach subordinates the perspectives of the rights-bearers over potential duty-bearers. The latter can plausibly complain ‘why should we pay when we had no idea that our activities were having this effect and, furthermore, when we could not have been expected to know that our activities were harmful?’ Reply (4) is, thus, unfair on the potential duty-bearers.

One might, however, revise reply (4) in light of this objection. Consider, again, the problem with reply (4). Suppose, for example, that by treading on a spot on the ground one causes harm to others on the other side of the globe

and suppose that one could not be expected to know that this happens. Pace the argument of the last paragraph, one may conclude here that it is unfair to insist that the person who causes the harm should pay the cost. Now suppose, however, that the person who treads on the spot on the ground derives a benefit from this activity. The behaviour that causes the harm to others also brings them benefits. This considerably changes the situation. In particular, the complaint that it is unfair to make them pay for effects they could not have anticipated loses its force here because, and to the extent that, they have also benefited from this harmful behaviour. This leads us towards reply (5).

However, reply (5) is, as it stands, not quite right because it makes no reference to the size of the benefit. It says simply that where someone has engaged in activities that have a harmful effect that they could not have foreseen then they are liable as long as they have benefited. But it would be implausible to say that they are liable for massive costs even if they only benefited slightly. In line with this, I suggest the following:

Reply (6): we should adopt a modified strict liability principle where this holds that if people engage in activities which jeopardize other people's fundamental interests by emitting excessive amounts of greenhouse gases then (i) they should bear the costs of their actions even if they were excusably ignorant of the effects of their actions if *they have benefited from those harmful activities* and (ii) *their costs should correspond to the benefits they have derived*.<sup>16</sup>

This version of strict liability clearly accommodates the point of view of the duty-bearer for it prevents cases arising where the potential duty-bearer is made to pay large costs even though they have derived only minimal gains. It is, therefore, superior to replies (4) and (5). However, since those who have emitted high levels of greenhouse gases have in fact also benefited considerably from them this principle, in practice, has considerable bite and would impose duties on very many people in industrialised economies. It thus provides considerable protection to the potential victims of dangerous climate change.

Reply (6) thus gives us the resources to meet the argument from 'excusable ignorance'. The Polluter Pays Principle may rightfully apply to those who are excusably ignorant of the consequences of their climate endangering activities if, because, and to the extent that they have benefited from their high emissions.

### **The 'Polluter Pays' Principle – three limitations**

Having addressed two challenges to the application of the Polluter Pays Principle to global climate change we may now consider three more serious problems. One problem with the Polluter Pays Principle is that it cannot cope with the effects on the climate that result from the emissions of earlier generations. On most accounts, carbon dioxide emissions began to rise during

the industrial revolution and continued to rise throughout the nineteenth and twentieth century. This means, though, that some of the polluters, and hence some of the duty-bearers, are dead and we therefore need to ascribe the duty to address their emissions to someone else. The principle that the polluter should pay obviously needs supplementation when the polluter no longer exists (Caney 2005, p. 756).

Now when assessing this objection we should bear in mind that the most marked increase in greenhouse gas emissions has taken place over the last 35 years or so. Indeed, it has recently been found that '[s]ince 1751 approximately 329 billion tons of carbon have been released to the atmosphere from the consumption of fossil fuels and cement production. Half of these emissions have occurred since the mid 1970s' (Boden *et al.* 2009). Carbon emissions from fossil fuel burning, cement manufacture and gas flaring rose from 1630 million metric tons of carbon in 1950 (which amounts to 0.64 metric tons of carbon per capita) to 4076 million metric tons of carbon in 1970 (1.10 metric tons per capita). By 1980, 5332 million metric tons of carbon were released (which equates to 1.20 metric tons per capita) and by 2006 the total emissions were a staggering 8230 million metric tons (1.25 metric tons of carbon per capita) (Boden *et al.* 2009). Carbon emissions thus increased more than five-fold between 1950 and 2006. This notwithstanding, most accounts recognise that there was a pronounced and significant increase between 1840 and the mid-twentieth century. For example, emissions rose from a mere eight million metric tons in 1800 to 33 million metric tons in 1840, rising further to 932 million metric tons by 1920 and reaching 1630 million metric tons by 1950 (Boden and Marland 2009). And, of course, many of those causally responsible during the period from 1840 to 1950 (and indeed later) are dead so the Polluter Pays Principle cannot be applied to their emissions. The Polluter Pays Principle is, thus, incomplete.

A second problem with the Polluter Pays Principle arises if and when some climate change occurs which does not stem from human activity. Climate scientists overwhelmingly contend that human activity is the major driver of the current and projected climate change. However, their formulations also often allow that human activity may not be the sole cause of climate change. The 'Summary for Policymakers' in the IPCC's *Climate Change 2001: Synthesis Report* reports, for example, that 'most of the warming observed over the last 50 years is attributable to human activities' (Watson *et al.* 2001, p. 5, emphasis added). How should we think about any warming that is not anthropogenic? A proponent of the Polluter Pays Principle faces a dilemma here. *Either* she holds that people should be protected against *all* malign climate change (where doing so is not unduly demanding) but then, if this is the case, she needs to go beyond a pure Polluter Pays approach and find some criterion for apportioning the remaining responsibility. She needs, that is, to find some principle to tell us who should bear that portion of the cost of dealing with harmful climate change that stems from

non-anthropogenic causes. *Or*, she commits herself to a purist version of the Polluter Pays Principle, which holds that the Polluter Pays Principle is the *only* fair principle for determining duties and hence the only climate change that should be covered is that stemming from human activity. On this view, then, the harm resulting from non-human activities should go unaddressed. But this is implausible. Our concern about climate change (including non-anthropogenic climate change) stems from its impacts on people's lives (their exposure to drought, malnutrition, flooding, disease, heat stress and so forth). Given this, we have reason to be concerned about non-anthropogenic climate change. Someone might claim that climate change that has been imposed by other people is worse in some sense than non-human-induced climate change but it would be odd to think that non-anthropogenic climate change is of no concern at all. From the point of view of the victim, what matters is that dangerous climate change damages one's vital interests. The view that persons are entitled to protection from anthropogenic climate change and not from non-anthropogenic climate change is thus untenable. But if we accept this then an additional principle is required. The proponent of the PPP thus faces a dilemma. Either we ignore non-anthropogenic climate change, but this is morally questionable. Or we call for protection against all malign climate change, but if this is the case an additional principle is required to attribute responsibilities to deal with non-human-induced climate change.<sup>17</sup>

A third, and final, point bears noting. We tend to assume that to make the polluter pay is in practice often to make the affluent pay. That we do so is understandable because industrialised countries like the USA and European countries have traditionally been the highest emitters of greenhouse gases. However, there is not a perfect correlation between high emissions and wealth, and in some instances making people pay in proportion to their emissions would perpetuate the poverty of some and reduce others to poverty. This is true, for example, for many in China and India.

The view that China should not be subject to a strict application of the Polluter Pays Principle is, however, resisted by some. They argue, for example, that China's emissions are now greater than those of the USA so it should bear responsibility for those emissions. In support of this claim they might appeal to a recent report from the Netherlands Environmental Assessment Agency, according to which in 2006 China's total CO<sub>2</sub> emissions were 6,220 million tonnes whereas the USA's CO<sub>2</sub> emissions in that year were 5,801 million tonnes (Nature 2007, p. 1038). China is, moreover, not alone, and India's emissions are considerable. A critic may therefore resist the idea that developing countries should be partially exempted from the Polluter Pays Principle.

This counter-argument is, however, unpersuasive for several reasons. First, the figures cited above refer only to the total amount CO<sub>2</sub> of emitted. China has, however, a much larger population than the USA. China's

population in 2006 was 1,323.6 million people as opposed to the USA's 301 million. Thus China's per capita emissions in 2006 were 4.7 tonnes of CO<sub>2</sub> per capita rather than the USA's staggering 19.3 tonnes per capita (Nature 2007, p. 1038). The same point applies if we look further than China. For example, in 2004 the developing countries (including China and India) comprised 80% of the world's population but emitted only 41% of the world's emissions (Rapauch *et al.* 2007, p. 10292). Second, however, the argument under consideration is inappropriate because the standard of living in China is much lower than the USA and it is wrong to impose mitigation duties on some if that jeopardizes their ability to attain a decent standard of living.<sup>18</sup> Third, the second point can be generalised further. And it is worth making the more general point that it would be a mistake to determine who should bear the burden of climate change in isolation from an analysis of their general economic entitlements. So if one holds, as I do, that people should not fall beneath a certain standard of living then the Polluter Pays Principle should be qualified to prevent it being the case that people are made to pay for emissions needed for their fundamental survival.<sup>19</sup>

These points do not – and are not intended to – establish that the Polluter Pays Principle should be abandoned when determining the duties of prevention and adaptation. They point to ways in which the Polluter Pays Principle must be supplemented with an additional principle (or set of principles). They establish that we need a principle of justice to deal with what we might term the Remainder, where I use this term to refer to harmful climate changes that stems from (a) the emissions of earlier generations, (b) non-human-induced climate change, and (c) the (legitimate) emissions of the disadvantaged.

### **The 'Ability to Pay' Principle**

How should we deal with the Remainder? In this section I want to argue that the Remainder should be filled by an 'Ability to Pay' approach. Stated formally, this approach states that the duty to address some problem (in this case, bearing the burdens of climate change) should be borne by the wealthy, and, moreover, that the duty should increase in line with an agent's wealth.<sup>20</sup> In principle, the Ability to Pay approach is indifferent to who caused a harm: its emphasis is on who can rectify that harm. So by contrast with the Polluter Pays Principle it is a forward-looking, rather than a backward-looking, principle. To appraise the plausibility of the Ability to Pay Principle and to help us refine it consider several objections that might be levelled against it.

#### ***A: Objection 1 – why should I pay for something that is not my fault?***

First, the advantaged might argue that it is unfair to make them cut back on emissions (and/or pay for adaptation) since the climate change in question

(the Remainder) is, *ex hypothesi*, not their fault. To adopt an Ability to Pay component, they complain, is to make them bear a burden for something that is no fault of their own.

This objection, however, does not unsettle the use of the Ability to Pay principle. The objection rests on the following assumption: it is wrong that some bear a burden for a problem that is not of their doing. This assumption seems to me highly implausible but the most important point to make in this context is that whatever happens some will be bearing a burden that it is not their fault. To see this consider three options. We might say that the advantaged should pay (option 1) or that the poor should pay (option 2). In both cases, however, some would be bearing a burden that stems from a problem that is not of their doing. We might then hold that nothing should be done (what is termed ‘business as usual’): this is option 3. But this too imposes a burden on some because of something that is not of their doing – for in this case victims of climate change (many of whom will be future generations) will have to bear a burden that stems from a problem that they did not cause. So all of the available options violate the assumption. It cannot therefore be used to invalidate an Ability to Pay approach.

We can go further. Reflecting on the three-option scenario just envisaged brings out the intuitive appeal of the Ability to Pay approach. Consider the three options again. In the first place we might hold that the poor should pay. However, to make the least well-off pay in a world where others are able to pay and still live a very affluent life seems perverse. In light of this, we might say that global warming should remain unaddressed. But this too seems unfair – especially on the poor members of some regions (such as Bangladesh, small island states and the Nile Delta) because they are particularly vulnerable to climate change. This leaves one group – the advantaged – and they have less cause for complaint than either of the other two groups.<sup>21</sup> The most advantaged are most able to pay the price without sacrificing any reasonable interests: therefore, they are under a duty to do so.

***B: Objection 2 – isn’t it counter-intuitive to ignore the historical record?***

Consider now a second objection to an Ability to Pay component. A pure Ability to Pay approach holds that the only criterion for apportioning responsibility for bearing a burden is who can best bear that burden. This purist approach is, however, vulnerable to the objection that, by giving no place to the historical genesis of a problem, it ignores a morally relevant consideration. As noted above, an Ability to Pay approach is wholly forward-looking. As such, though, it is in conflict with a deep conviction that who should bear the burdens of climate change cannot be wholly divorced from an understanding of the historical origin of the problem. A wholly forward-looking approach, it might be argued, is out of kilter with some of our deepest moral convictions.



Two responses are available to proponents of the Ability to Pay principle. First, they might dismiss the intuition and bite the (counter-intuitive) bullet. Second, they might seek to accommodate the objection being raised. I shall pursue this second strategy. I propose the following position as an initial step in the right direction:

**ATP\***: The duties to bear the Remainder should be borne by the wealthy but we should distinguish between two groups – (i) those whose wealth came about in ways which endangered the Earth's climate and (ii) those whose wealth came about in ways which did not endanger the Earth's climate – and we should apportion greater responsibility to (i) than to (ii).<sup>22</sup>

To elaborate further: (i) refers to currently alive people whose holdings resulted from a historical process that involved excessively high emissions. So if a person owns £200,000 and if this is the case because their grandparents acquired this wealth in a climate-endangering way then that person would fall into category (i). The key point is that somewhere along the historical chain of events leading them to own their current holdings there have been climate injustices. Those in category (i), then, have received wealth because of the commission of injustices. For convenience's sake I shall term those who belong to category (i) as 'dirty developers' and those in category (ii) as 'clean developers' (even though some of those in category (i) might themselves not have emitted excessive levels of greenhouse gases).

This qualified version of the Ability to Pay has intuitive appeal but can we say more in its favour? I think we can. My suggestion is that those whose wealth did not come about in a climate-endangering way can provide more reasons to justify their wealth (and thereby to resist the claim that they should devote resources to ameliorating climate change) than those whose wealth did come about in a climate-endangering way. They have more reasons at their disposal to justify their view that they should not have to pay for the mitigation and adaptation costs needed to address the ill effects of climate change. The argument can best be illustrated by comparing two people. Suppose that we are apportioning responsibilities for addressing climate change. Imagine that there are two people, A and B, and suppose that they are equally wealthy. The historical process that led to A's possession of her current wealth is one that involves excessive carbon emissions. (She thus falls into category (i) of the **ATP\***.) B's wealth, by contrast, has not come about in climate-endangering ways. Suppose now that someone proposes that A and B should bear part of the burden of dealing with climate change and should do so equally. They will no doubt adduce various reasons to resist this demand. Familiar reasons would include:

- (1) taxing the wealthy undermines economic growth because it reduces the incentive to engage in wealth-creation (the economic growth argument).

- (2) taxing the wealthy restricts the liberty of the wealthy (the liberty argument).
- (3) taxing the wealthy is unfair because they are entitled to their wealth, in virtue of the fact that it came about in a just way (the entitlement argument).

They might also, no doubt, adduce other reasons. Now the relevant point is this: B can invoke all of these reasons in support of her position whereas A can only invoke reasons (1) and (2). *Ex hypothesi*, A cannot invoke an entitlement-based argument in support of her position because her wealth did not come about in a just way. She therefore has less cause for complaint than B. The point can be put in another way: the significance of historic wrongs (like excessive carbon emissions or highly damaging deforestation) is that they discredit historical arguments that take the form ‘we’re entitled to X because our possession of X came about in a just way’.<sup>23</sup> Now insofar as we are concerned about historic injustices we should ask less of clean developers than dirty developers.

To further determine the plausibility or otherwise of ATP\* let us consider two additional challenges to it.

### ***C: Objection 3 – why should ‘clean developers’ pay anything?***

Someone might dispute ATP\* on the grounds that none of the burden should be borne by wealthy persons if their wealth did not come about in a climate-endangering way. The proposal in other words is to delete category (ii) from ATP\*. On this proposal the duty to bear the burden of the Remainder should fall squarely on those privileged members of the world whose wealth came about in a climate-endangering way. This criticism thus posits a challenge: why should the wealthy pay anything if their wealth came about through clean development?

A number of points can be made in reply. First, there are familiar cases where we think that a person is obligated to assist others even when they played no part in the other’s poverty or sickness. In such cases we think that a positive duty falls on those able to help. For example, if someone sitting next to you at a table suddenly becomes seriously ill and you’re well placed to help, then we tend to think that you should do so. It would be an odd person who refused to aid on the basis that they did not cause this harm. Even if people disagree with Peter Singer’s claim that persons are obligated to aid others up and until the point that the cost to them of giving is greater than the benefit received, there is a fixed conviction that there is a duty to aid to some extent (Singer 1972). This leads to a second point: resistance to the idea that those who did not cause a problem can nonetheless be obligated often stems from a concern that they will be subject to unduly demanding duties. But there is, of course, no reason why this need be the case. One can respond to this



concern by affirming positive duties on those able to pay so long as it is not too demanding. Third, and finally, as is commonly argued, the best account of what is wrong with causing a harm to befall others appeals to the importance of being able to pursue their interests. But, if it is morally important that persons can pursue their interests, then it entails not just that there is a duty not to harm those interests but also a duty to aid those who are vulnerable.<sup>24</sup> If we hold that there is a duty not to harm someone because such harms leave people unable to advance their fundamental interests then this suggests that we care about people being able to advance their fundamental interests. But if we hold this, it surely entails a positive duty on the behalf of others to advance those interests. The first objection to ATP\* thus fails.

***D: Objection 4 – why focus solely on previous climate injustice?***

Let us consider, now, an additional and final objection. This time the concern is with the contention that greater responsibilities should be borne by wealthy persons whose wealth came about in a *climate-endangering way*. Why, a critic might ask, should the Ability to Pay Principle focus solely on ‘those whose wealth came about in a climate-endangering way’ rather than ‘those whose wealth came about in an unjust way’? Imagine, for example, that some have wealth and that they do so because their ancestors participated in the slave trade (and I am assuming that that did not involve high carbon emissions or methane emissions and so on). Or consider those whose current affluence has arisen because they have inherited wealth from ancestors who appropriated land from indigenous peoples (and, again, let us assume that they did not emit high levels of carbon emissions and did not engage in deforestation). Their current holdings are thus based to some extent on a history of injustice: can it not be said of them that they have less claim on their current wealth? Furthermore, the critic might argue, the reasoning adduced in support of the ATP\* (in particular the argument comparing the clean developer B with the dirty developer A) does not in fact support ATP\*. Let me explain. The argument in question compared A and B and made the point that A could muster less reasons on behalf of their claim to retain their wealth: in particular they could not employ an entitlement-based theory in their defence. But, and this is the key point, the same point could be made about those whose wealth came about because of the slave trade or political corruption or economic imperialism. They too cannot use an entitlement-based theory to defend their current holdings. Thus the normative rationale for ATP\* actually entails that greater responsibility should be borne by the wealthy whose wealth came about in unjust ways. In light of this line of reasoning, we should revise ATP\* (and the way in which it defines category (ii)) so that it reads as follows:

**ATP\*\*:** The duties to bear the Remainder should be borne by the wealthy but we should distinguish between two groups – (i) those whose wealth came about

in unjust ways and (ii) those whose wealth came about in ways which were not unjust – and we should apportion greater responsibility to (i) than to (ii).

Given the argument mooted for **ATP\*** (i.e. the comparison of A and B above) we should prefer **ATP\*\*** to **ATP\***.

Several further comments about **ATP\*\*** are in order. First, someone might argue that it is particularly fitting that those whose holdings stem from a climate injustice make recompense for that particular wrong. Consider, for example, someone whose wealth stems from the fact that their grandparents collaborated with the slave trade: one might think it particularly appropriate that they deal with the contemporary ill effects of slavery. Or consider someone whose wealth came about because their ancestors appropriated wealth from Jews during the Second World War: one might think it appropriate that they address anti-semitism. **ATP\*\*** accommodates such an intuition but it does not make it mandatory. It would allow those whose wealth stems from injustice to discharge their duties in this specific way but it does not require this kind of action. Second, in distinguishing between (i) and (ii) I am not committed to claiming that many or indeed any people fall into category (i). **ATP\*\*** does not assume that there are in fact people in both categories. My point is to establish the morally relevant considerations and categories, not to make an empirical claim. Third, we should record that the **ATP\*\*** needs to be stated more precisely. We need, for example, to say how the duty should be shared among the two groups mentioned. By what formula or rule? In the meantime, however, I hope that the preceding arguments make a persuasive case for **ATP\*\***.

Before considering some implications of the view defended here, it is worth providing a statement of my conclusions. Thus far I have argued for two main positive conclusions. First, I have accepted a qualified version of the Polluter Pays Principle where this holds that

Principle 1: Persons should bear the burden of climate change that they have caused so long as doing so does not push them beneath a decent standard of living (the *Poverty-Sensitive Polluter Pays Principle*).

Second, however, I have argued that the Polluter Pays Principle cannot cover all aspects of the problem (non-anthropogenic climate change, the emissions of the poor, and the emissions of past generations – what I have termed the Remainder). This leads to my second positive claim. For I have argued that

Principle 2: The duties to bear the Remainder should be borne by the wealthy but we should distinguish between two groups – (i) those whose wealth came about in unjust ways, and (ii) those whose wealth did not come about in unjust ways – and we should apportion greater responsibility to (i) than to (ii). (*the History-Sensitive Ability to Pay Principle*).

The view defended, then, is a hybrid one that combines two separate principles.

### The implications of the hybrid model

This provides the theoretical framework within which I think we should address climate change. I now want to describe it more fully and then explore its practical implications.

Let us begin then by fleshing out these two principles further. Three points are in order. First, nothing has been said so far on who the bearers of these duties are. Many thinkers and commentators treat ‘countries’ as the bearers of the duties of prevention and adaptation. This, no doubt, is in part a reflection of the fact that much of the focus on combating climate change is on international treaties like the Kyoto Protocol. It is, however, a consequence of the view defended above that the duties outlined above fall not just on states but also on other types of actor. For example, the logic of the *Poverty-Sensitive Polluter Pays Principle* is that all (sufficiently affluent) agents who are causally responsible for high emissions are under an obligation to cut back their emissions according (and/or spend money on adaptation). Now many actors other than national governments play a causal role. These include, for example, (1) individuals for individuals can choose whether to fly or not, what car to drive, how much heating or air-conditioning to use and so on. They also include (2) firms. Firms can frequently choose how much energy they need to consume, how much transportation to employ, the extent of building insulation, the level of heating and so on. They also include (3) sub-state political authorities like cities or the member states of federal systems like the USA. This level of analysis is often neglected, but recent research for the Pew Center on Global Climate Change has revealed how different states in the United States of America pursue quite different policies on climate change. States can exert considerable control over many areas that bear on greenhouse gas emissions (passing regulations on household goods; requiring use of renewable energy sources; restricting carbon emissions of power plants) and some states have pursued more aggressive mitigation policies than others (Pew Center 2006). To give some examples: Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont have pledged themselves to reducing greenhouse gas (GHG) emissions to 10% lower than 1990 levels by 2020. California has committed itself to reducing GHG emissions to 1990 levels by 2020 and New Mexico has pledged to reduce its GHG emissions to 10% lower than its 2000 level by 2020 (Fischer and Constanza 2005, p. 301). Other states have been far less active.<sup>25</sup> A final category of actors who play a causal role in generating climate change is, (4), international financial institutions (who often incentivise environmentally harmful economic growth). The duties generated by the *Poverty-Sensitive Polluter Pays Principle* thus fall to all these kind of actors. The same is true of the **ATP\*\***. The thought underlying the latter is that those able to pay have a duty to do so and hence this duty falls too not simply on affluent ‘states’ but on any body that can possess wealth, such as individuals, corporations and so on.

Second, it is worth noting that although I have argued that the most advantaged have a leading responsibility to play, my argument also places duties on the least advantaged as well. For if they can develop in ways that do not involve high levels of fossil fuel combustion, and can do so without great cost to themselves, then it would be wrong for them to pursue a high emissions policy.

A third point also bears recording: it might be thought that my position justifies a policy according to which later generations pay for climate change. The thought here is that future generations will be wealthier than current generations and hence more able to pay; as such an ‘ability to pay’ criterion should allocate duties to them.<sup>26</sup> This, in effect, amounts to a policy of not preventing climate change for now and then trying at some point in the future both to prevent further climate change and also to adapt to the changes that have occurred. Although future people may well be better off than current people, I believe that it does not follow that an Ability to Pay Principle has the implication of postponing action into the future. There are at least two reasons for this. First, although future people may have more wealth, the costs will also be very much greater in the future. It will cost less to prevent the problem from arising than to allow it to arise and then seeking to adapt to it later.<sup>27</sup> Second, unless mitigation takes place now, there will be dangerous climate change to which people are unable to adapt. A failure to mitigate would therefore inevitably result in injury to some future people and it would be wrong knowingly to allow a wrong to occur with a view to seeking to compensate those wronged later. People should not be wronged in the first place. Mitigation now is thus not only cheaper than postponing action but it is also required if we are to respect people’s fundamental interests.

Let us, finally, turn to the policy implications of the view defended on pp. 695–708. Different kinds of policy have been proposed to cut back on emissions. These include (among other things): (a) carbon quotas and trading policies, (b) carbon taxes, (c) clean development initiatives, and (d) adaptation programmes. Each of these instruments can be used in line with the view defended above. What is required is a set of measures that prevent people (within reason) from emitting excessive emissions, ensure that those who have emitted more than they should have done cut back their emissions and support adaptation, and that ensure that the most advantaged cover the Remainder. The policy instruments listed above can all serve these objectives.

(a) Consider first a system of carbon quotas and carbon trading. This approach is affirmed in Article 17 of the Kyoto Protocol and a system of carbon-trading (the EU Emissions Trading Scheme) came into effect on 1 January 2005.<sup>28</sup> Advocates of carbon trading often suggest that ‘states’ have quotas that they can use, or sell, but this is not the only option. Alternatively, one might suggest a scheme where permits are auctioned off to firms who then pass the costs on to the consumer and in which the proceeds are spent to further people’s entitlements. Finally, some have proposed a system of

individual quotas (what has been Domestic Tradable Quotas).<sup>29</sup> Now a quota-based system can, if effectively enforced, serve the goal of reducing carbon dioxide. Many who favour a system of quotas hold that everyone should have an equal per capita entitlement to emit carbon dioxide.<sup>30</sup> The account developed above would, however, dissent from this in several ways. First, following the Polluter Pays Principle it would hold that those who have in the near past emitted excessive amounts of carbon dioxide should have less now. Second, the arguments above claim that the least advantaged have a stronger claim to emit carbon dioxide than the advantaged. Third, I have argued that the most advantaged should bear the cost of the emissions of both past generations and of the disadvantaged, in which case it follows that the advantaged should not have an equal right to emit carbon dioxide. The key point I wish to make though is that the account developed above can be reflected by a system of emissions quotas and carbon trading.

(b) The view defended above can also, however, employ a system of taxes. In the first place, a system of carbon taxes can be utilised both to discourage people from exceeding their fair share and also to ensure that those who do exceed their fair share pay money in compensation (thereby making the polluter pay). Second, one can ensure that carbon taxes exempt the very poor. In virtue of both of these features, carbon taxes can realize what I termed the *Poverty-Sensitive Polluter Pays Principle* (as defined on p. 708). Third, as proponents of carbon taxes often observe, carbon taxes can produce a ‘double dividend’. So as well as discouraging high emissions they can generate funds – funds that can be spent on adaptation.<sup>31</sup> Finally, and moving away from carbon taxes, a system of progressive taxation can be implemented in countries with an extensive history of industrialisation to ensure that the most advantaged pay for those types of climate change not covered by the Polluter Pays Principle (which is what would be required by the *History-Sensitive Ability to Pay Principle* defended above).

The key point to observe then is that the principles I have defended can be implemented via either a ‘cap and trade’ system of carbon trading or a system of carbon (and other) taxes. Though the principles I defend are rather complex the preceding discussion shows how taxes and trading schemes can be designed to approximate them.

(c) Note, further, that a successful programme of combating climate change must find ways that poor countries can develop and meet their legitimate needs without jeopardizing the earth’s atmosphere. However to attain such sustainable development there must be financial schemes which both stimulate research and development of clean technology and which also ensure that such clean technology is transferred from rich to poor countries.<sup>32</sup> This, however, requires funding and this again requires us to turn to the Hybrid View.

(d) Finally, the Hybrid View can determine who should fund adaptation. As was noted earlier, adaptation is necessary. It is widely recognised that the

global poor will be highly vulnerable to dangerous climate and therefore their adaptive capacity needs to be developed. Applying the Hybrid View, it is clear that the global poor themselves should not bear the cost. The Poverty-Sensitive Polluter Pays Principle would exempt them (either because of their poverty and/or because their emissions are very low) and since they are disadvantaged they would also be exempted by the Ability to Pay component. There therefore needs to be a global adaptation fund that is funded by those who have emitted excessive amounts of GHGs and by the advantaged of the world.

## Conclusion

It is time to conclude. This paper has examined the question of who should bear the burdens of climate change. It would be convenient if we could rely on a simple formula to answer this question. I have argued, however, that no such simple formula is available. The truth is rather more complex than any crude slogan. To answer to the question we need to draw on qualified versions of the Polluter Pays Principle and the Ability to Pay Principle.

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## Notes

1. For excellent empirical data on all these see McCarthy *et al.* (2001), Schellhuber *et al.* (2006), Parry *et al.* (2007).
2. This list is not exhaustive. A third principle holds that those who have benefited from industrialization, and/or from climate change itself, should pay (the Beneficiary Pays Principle – BPP). I have criticised this principle elsewhere and will not



- discuss it here. For a defence of the view see Gosseries (2004). For criticism see Caney (2006, pp. 471–476).
3. For defences of this kind of approach see Neumayer (2000) and Shue (1999, pp. 533–537). Shue himself prefers not to describe his position as a polluter pays principle (p. 534) but his position conforms to the PPP as I interpret it.
  4. Joint Science Academies' Statement: Global Response to Climate Change (2005).
  5. See, further, Hare and Meinshausen (2006).
  6. Some, like Bjørn Lomborg, have contested this, arguing that prevention will cost too much and will yield too little. See Lomborg (2001, pp. 305–318, especially p. 318). Lomborg's arguments are, however, unpersuasive. For a good critique see Cole (2003).
  7. For discussion of the West Antarctic Ice Sheet see Rapley (2006, pp. 25–27). For discussion of the Greenland Ice sheet see Lowe *et al.* (2006, pp. 29–36).
  8. For good discussions of the Atlantic Thermohaline Circulation see Schlesinger *et al.* (2006, pp. 37–47) and Wood *et al.* (2006, pp. 49–54). See also Vellinga and Wood (2002).
  9. See 'Paper No. 1 Brazil: Proposed Elements of a Protocol to the United Nations Framework Convention on Climate Change, Presented by Brazil in Response to the Berlin Mandate', Item 3 of the Provisional Agenda of the Seventh Session of the Ad Hoc Group on the Berlin Mandate, FCCC/AGBM/1997/MISC.1/Add.3, 30 May 1997.
  10. See the SBSTA's 'Progress Report on the Review of the Scientific and Methodological Aspects of the Proposal by Brazil', Item 4 of the Provisional Agenda of the Fourteenth Session of the SBSTA, Bonn, FCCC/SBSTA/2001/INF.2, 10 July 2001.
  11. For further extended analysis on the uncertainties in determining causal responsibility see den Elzen and Schaeffer (2002).
  12. See, for example, Allen (2003), Allen and Lord (2004), and Allen *et al.* (2007).
  13. This kind of response has been made by a number of different thinkers, though they do not always agree on the date after which the plea of excusable ignorance is inappropriate. See, for example, Singer (2002, p. 34), who proposes 1990 as the cut-off date, and Neumayer (2000, p. 188), who suggests that the cut-off date should be in the mid-1980s. Shue also makes this kind of response but does not specify a key date after which one cannot claim excusable ignorance (Shue 1999, p. 536).
  14. I am grateful to Andrew Williams for pressing this response when I presented this paper at the British Academy.
  15. This reply is also suggested in passing by Peter Singer (2002, p. 34). Singer, however, does not press the point and in a desire to construct a principle that might enjoy support among industrialised countries he makes no further use of the idea of strict liability in his argument.
  16. In his illuminating analysis, Axel Gosseries (2004) also mentions the relevance of the size of the benefit that the excusably ignorant perpetrator receives from their harmful act to the issue of whether (and by how much) that perpetrator owes (2004, pp. 40–41). However, it is not clear from his discussion of liability incurred when excusably ignorant what criteria determine the relationship between the amount of benefit received and the size of the duty owed. On my account, the cost that can be demanded should correspond to the benefit actually enjoyed. It is not clear from Gosseries' account whether he would concur and what he says suggests that he would not (2004, p. 41).
  17. This point is made by Edward Page. As he rightly says a PP approach cannot cope where climate change is 'entirely nonanthropogenic in origin' (Page 2006, p. 169).

- of also p. 172). Actually we do not need to imagine a case where it is *wholly* anthropogenic to see the limitations of the Polluter Pays Principle for even if non-anthropogenic causes are *part* of the cause then the Polluter Pays Principle is incomplete.
18. Some make a second kind of argument. They point out that the increase in carbon emissions is most marked in developing countries like China and India. This is true. To take 2004 again, 73% of the increase in emissions came from the 80% of the earth's population that come from developing countries (Raupach *et al.* 2007, p. 10292). However, this does not entail that the Polluter Pays Principle should be applied in full force to China and India. First, as argued in the text above, whether this increase in emissions is justified or not depends in part on the material needs of the Chinese people and the extent to which the increase in emissions is necessary to meet these. Second, even if we ignore this first point, a high rate of increase is not the relevant benchmark anyway. For one needs to know China's absolute level of emissions (per capita), not the rate of increase. So if the increase is great but the level of emissions is still low, then what should inform policy is the fact that the quantity of emissions (per capita) is low.
  19. See also Shue's affirmation of a 'guaranteed minimum' principle (1999, pp. 540–544). For an important defence of 'sufficiency' see Frankfurt (1987).
  20. See here Shue's affirmation of an 'ability to pay' principle (Shue 1999, pp. 537–540, especially p. 537). (For further discussions where Shue has argued that the wealthy should bear the mitigation and adaptation costs of climate change and that the poor be given less demanding duties see: Shue 1993, pp. 42–43, 56, 58; Shue 1994, pp. 343–366; Shue 1995, pp. 250–257.) Darrel Moellendorf also argues that the Ability to Pay Principle should play a role. In particular, he argues that it is needed to cover the fact that the Polluter Pays Principle cannot deal with the emissions of the dead. See his succinct but perceptive treatment: Moellendorf (2002, pp. 97–100).
  21. For an earlier statement of this argument see Caney (2005, pp. 771–772). For a closely related line of reasoning see Moellendorf (2002, p. 100).
  22. For a similar, but nonetheless distinct, position see Page's illuminating reflections in *Climate change, justice and future generations* (2006, pp.172–173). Page's suggestion is that there should be 'some "discount" in what is required of the better off when their behaviour is not [the] cause of the problem' (p.172). His view, however, differs from ATP\* in several fundamental respects. First, ATP\* applies this modified Ability to Pay approach simply to the climate change covered by the Remainder and not to all climate change. Second, Page's claim is that "ability to pay" arguments gain at least some of their plausibility from the implicit assumption that those who have the ability to solve environmental problems are generally responsible for them' (p. 173). ATP\*, by contrast, does not claim this. It contends that those who have the ability to pay have an even greater responsibility if, and because, they have inherited wealth and resources that were produced in a way that involved very high emissions (*even though they themselves were not 'responsible for' those emissions*). Such people are obligated (for ATP\*) not because they have emitted high levels themselves (for they might not have) but because they are wealthy and that wealth stems from the excessive emissions of earlier generations.
  23. See, further, Caney (2006).
  24. This is brought out nicely by Allen Buchanan (2004, pp. 89–92).
  25. In addition to this, recent research has shown that the policies pursued by city councils often has a marked impact on climate change. Some cities, for example, belong to the Cities for Climate Protection (CCP) programme and through it adopt



- policies that cut emissions. See Betsill and Bulkeley (2004) and Bulkeley and Betsill (2005).
26. I am grateful to Vijay Joshi for raising this issue.
  27. This view is strongly confirmed by Sir Nicholas Stern (2007)
  28. For Article 17 of The Kyoto Protocol see: <http://unfccc.int/resource/docs/convkp/kpeng.html>.
  29. See Starkey and Anderson (2005); Fleming (2006).
  30. See Baer *et al.* (2000); Neumayer (2000, pp. 185–192); Athanasiou and Baer (2002, especially pp. 76–97).
  31. One recent study finds, for example, that if a tax of \$21 for each metric ton of carbon were universally adopted then it would generate \$130 billion per annum. See Sandmo (2005, p. 48).
  32. This point should not be confused with support for the ‘clean development mechanism’ that is articulated in Article 12 of the Kyoto Protocol (<http://unfccc.int/resource/docs/convkp/kpeng.html>). The latter is, I have argued elsewhere, profoundly flawed. For the reasons why see my paper ‘Markets, morality and climate change: what, if anything, is wrong with emissions trading?’ (Caney forthcoming).

### Notes on contributor

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