

## Fairness in allocating the global emissions budget

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*Abstract.* One central question of climate justice is how to fairly allocate remaining “carbon space” or a global emissions budget. Some commentators hold that the idea of fairness is hopelessly equivocal on this point. Others claim that we need a complete theory of distributive justice to answer the question. This paper argues to the contrary that, given only weak assumptions about fairness, we can show that fairness requires an allocation that is at least as prioritarian as the equal per capita view. Since even the equal per capita view is more prioritarian than is politically feasible, fairness is univocal enough for all practical purposes.

*Keywords.* climate change, climate justice, fairness, emissions budget, carbon space

Fairness is, as the American saying goes, “like motherhood and apple pie.” No one is against fairness. But while everyone can agree that, other things being equal, claimants to a contested resource ought to divide the resource fairly, they cannot always agree on what a fair division looks like. When it comes to climate justice, some commentators suggest that the idea of fairness is so hopelessly ambiguous that there can be no agreement about what fairness

requires of global climate policy.<sup>1</sup> By contrast, Stephen Gardiner writes that there “is a strong ethical consensus surrounding the general direction of future [climate] policy. In the short- to medium-term...most of the burdens of [mitigation] must be borne largely by the developed nations.”<sup>2</sup>

In this paper, I argue that even minimal assumptions show that this “strong ethical consensus” is correct, at least with respect to the burden of emissions abatement: fairness requires developed countries to bear most of the burdens of reducing humanity’s greenhouse gas emissions. Rather than arguing for one particular distribution of that burden, I show how we can understand all of the various proposals in terms of a single, flexible conception of fairness; and then use that account of fairness to show that on very minimal assumptions, all of the plausible proposals point in the same direction.

To make this more precise, it will help to express existing proposals or policies in terms of the effective division of a global emissions budget. Even policies that do not explicitly discuss an emissions budget or explicitly allocate “carbon space” to various parties have implications for how an implied emissions budget is divided between various emitters. For instance, the current regime based on Intended Nationally Determined Contributions (INDCs), implies that the United States, the European Union, and China will collectively consume roughly a quarter the remaining emissions budget.<sup>3</sup> Taking such implicit allocations into account, we can arrange policies along a continuum, according to how they allocate emissions between richer and poorer countries. At the midpoint is the Equal Per Capita view,

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<sup>1</sup> See, e.g., Soltau, 2009: 152.

<sup>2</sup> Gardiner, 2011: 402. Note that Gardiner’s claim is stronger than the one I make here. He claims a consensus about the all-things-considered best distribution of the overall burdens of “shift[ing] away from fossil fuels.”

<sup>3</sup> Chaturvedi and Ghosh 2015

on which each individual on the planet should have an equal share of the emissions budget. On one side of the midpoint are views that allocate more of the budget to developing countries than the Equal Per Capita view does. Call these positions “Prioritarian,” since they give priority to the less well off (though not necessarily because of explicitly prioritarian commitments). On the other side of the midpoint are views that allocate less to developing countries than the Equal Per Capita view does. Call these positions “Anti-Prioritarian.” The consensus that Gardiner mentions, then, is that fairness requires giving developing countries at least as much as the Equal Per Capita view does. The central claim of this paper is that we need only a thin conception of fairness to justify that consensus.

This argument aims to rebut three kinds of views about fairness in mitigation policy. First, it aims to rebut arguments for “grandfathering” principles that would allocate disproportionately large shares of the budget to high-emitting countries. Second, it aims to rebut those who think the idea of fairness is hopelessly ambiguous when applied to the emissions budget. Third, it aims to rebut the claim that we need a robust theory of global distributive justice in order to determine how to allocate the budget fairly.<sup>4</sup>

### **1. The Proportional Claims Account and the emissions budget**

This paper relies on an account of fairness that I call the Proportional Claims Account, which which, in addition to being independently plausible, is flexible enough to incorporate many different conceptions of fairness, including all of the conceptions at work in the literature on fairness in allocating the emissions budget. The account derives from the work of John Broome, Brad Hooker, and Nicholas Rescher.<sup>5</sup> The Proportional Claims Account says that

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<sup>4</sup> Caney, 2012.

<sup>5</sup> Broome, 1990; Hooker, 2005; Rescher, 2002.

fairly allocating a divisible good requires granting to each claimant a share of the good that is proportional to the strength of that claimant's fairness-relevant claims on the good, where a "fairness-relevant claim" is one that arises from need, desert, or entitlement. For the purposes of the Proportional Claims Account, desert is understood as desert arising from some source other than need, and entitlement is understood as arising only from prior agreements or institutional rules.

On the Proportional Claims Account, when each claimant has an equal claim on the good, the good should be divided equally. When some claimants have a stronger overall claim than others do, the former should receive larger shares than the latter, in proportion to the relative strength of each claimant's claim. For instance, if Romeo owes Benvolio and Abram sixty ducats and twenty ducats, respectively, but has only forty ducats with which to repay them, the Proportional Claims Account entails that Romeo should give thirty ducats to Benvolio and ten to Abram, since Benvolio's claim on Romeo's money was three times as strong as Abram's.

The Proportional Claims Account leaves open two important sets of questions: First, by what standards shall we judge the strength of any claimant's desert, need, or entitlement? That is, what theories of desert, need, and legitimate agreement shall we use? Second, how shall we compare or weight claims arising from different sources? How, for instance, should we allocate some resource between two claimants if one has only a desert-based claim and the other has only an equally strong need-based claim? Are these of equal weight? Does desert generate a stronger claim, other things being equal, than need (or *vice versa*)? And how, exactly, do we calibrate the metrics for desert and need so that we can say that the first claimant's desert-based claim is "just as strong" as the other's need-based claim? The Proportional Claims Account does not contain answers to these questions.

While the failure to answer these questions might seem like a weakness in the Proportional Claims Account, it is actually an advantage for present purposes. We can combine the Proportional Claims Account with any theories of (non-need-based) desert, need, and (rule- or agreement-based) entitlement. Given this flexibility, it is hard to see what kinds of fairness-related claims could not be incorporated into the Proportional Claims Account. Furthermore, we can weight each kind of claim as we see fit. In some cases, such as those that attach all weight to need, this will result in a degenerate version of the Proportional Claims Account, in which the fair allocation gives to each claimant in proportion to his or her need. Between the degenerate and non-degenerate versions, we can understand any position in the climate justice literature as resulting from a different specification of the Proportional Claims Account. For instance, John Broome's and Eric Neumayer's arguments for historically-sensitive Equal Per Capita views implicitly attach all weight to desert.<sup>6</sup> Henry Shue's focus on subsistence emissions puts at least most of the weight on need, as does Darrel Moellendorf's focus on reducing poverty.<sup>7</sup> And so on. Since, as I will argue below, there is no plausible position on which any of the three kinds of fairness-relevant claims point in opposing directions, the Proportional Claims Account allows us to draw conclusions about how to allocate the emissions budget without specifying the Proportional Claims Account further. This means that we can reach conclusions about the just allocation of the emissions budget without settling difficult philosophical questions about desert, need, or distributive justice.

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<sup>6</sup> Broome, 2012, pp. 70; Neumayer, 2000.

<sup>7</sup> Shue, 1993; Moellendorf, 2014.

## 2. The Proportional Claims Account and the emissions budget

The easiest way to apply the Proportional Claims Account to mitigation is to frame mitigation policy in terms of a global emissions budget. Roughly, the global emissions budget is the amount of carbon that humanity can collectively emit before exceeding some maximum acceptable risk threshold (e.g., a 66 percent chance of exceeding 2°C warming). The existence of such a cap is implied by any mitigation policy that requires reducing global emissions to zero. This cap turns the legal right to emit greenhouse gases into a finite, rivalrous good, which in turn makes the emissions budget a divisible valuable resource.

The main argument of this paper uses the Proportional Claims Account to characterize a fair allocation of the emissions budget:

- (1) On any defensible account of desert, developing countries collectively have at least as strong a desert-based claim to the remaining emissions budget than developed countries do, even adjusted for population size.
- (2) On any defensible account of need, developing countries collectively have a stronger need-based claim to the remaining emissions budget as developed countries do, even adjusted for population size.
- (3) Existing agreements do not establish any entitlements, but those agreements are consistent with allocating more to developing countries than to developed countries.
- ∴(4) Given the Proportional Claims Account's understanding of "fairness-relevant claims," developing countries' fairness-relevant claims to the remaining emissions budget are at least as strong as developed countries' fairness-relevant claims to it, even adjusted for population size, regardless of how we weight desert, need, and entitlement.

- (5) The Proportional Claims Account of fairness entails that fairly allocating a divisible good, such as the emissions budget, requires allocating it in proportion to the strength of the claimants' fairness-relevant claims on the good.
- ∴(6) Given any defensible accounts of desert and need, and regardless of how we weight desert, need, and entitlement, the Proportional Claims Account entails that fairly allocating the remaining emissions budget requires giving at least as much to developing countries, on a per capita basis, as to developed countries.
- (7) Given the flexibility to define and weight desert, need, and entitlement as we see fit, the Proportional Claims Account encompasses any possible theory of the fair allocation of the emissions budget.
- ∴(8) On any defensible theory of fairness, fairness requires allocating at least as much of the emissions budget to developing countries, on a per capita basis, as the developed countries receive.

This conclusion is equivalent to saying that either the Equal Per Capita view or some Prioritarian view is correct.

This version of the argument is oversimplified in that it relies on a crude categorical distinction between “developed” and “developing” countries. A more nuanced version of the argument might draw finer categorical distinctions between, e.g., high-, middle-, and low-income countries or between countries with high *per capita* emissions and those with low *per capita* emissions (either cumulatively or currently); or at an even more fine-grained level, the argument could be restated in a way that takes each country's circumstances into account.<sup>8</sup> I do not think such national differentiation would change the basic conclusion that fairness

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<sup>8</sup> On the distinction between “categorical” and “national differentiation,” see: Pickering, Vanderheiden and Miller, 2012.

requires giving at least as much to developing countries as to developed countries, except perhaps in relatively minor cases. Since national differentiation would greatly complicate the exposition of the arguments, however, the following sections will rely on the cruder distinction between “developed” and “developing” countries, and I will return to the issue of national differentiation in Section 5.

In the next section, I defend three key assumptions behind the main argument. In the section after that, I give arguments for two key premises about desert- and need-based claims on the emissions budget.

### **3. Defending the assumptions behind the main argument**

The main argument of this paper rests on three key assumptions: first, that the morally relevant claimants on the emissions budget are collective, transgenerational entities, such as states, rather than individuals; second, that humanity has not already spent the emissions budget; and third, that we need not rely explicitly on a theory of global distributive justice when making judgments about the fair allocation of the emissions budget. I defend each of these assumptions in the following subsections.

#### *3.1. Societies are the claimants on the emissions budget*

Before we can apply the Proportional Claims Account to the emissions budget, we need to consider who the claimants to the budget are. In particular, are they individual people, states, societies, or some other kind of entity? *For the purposes of thinking about international mitigation agreements*, I think the relevant claimants are societies, for which states (or groups of states) are imperfect proxies. There are, of course, vitally important questions about how emissions rights ought to be distributed within a society, and different ways of implementing

an international agreement might have some effect on those domestic distributions, but since the primary function of an international agreement is to distribute the burdens of mitigation between states, I will focus here on states' collective claims on shares of the emissions budget.

Beyond this practical point about international agreements, there are moral reasons to think that societies, as opposed to individual, are the rightful claimants on the emission budgets. First, any given individual's carbon footprint depends critically on social choices that are largely beyond his or her control. This is partly because social choices about, e.g., energy policy, urban planning, agricultural policy, etc. significantly affect the carbon footprint of one's home, one's commute, etc. It is also partly because attributing all emissions to individuals would require the indirect attribution of emissions by entities like governments, over whose emissions any given individual has very little control. Second, the primary economic benefits derived from "consuming" some of the emissions budget tend to be shared across various members of a society in ways that are hard to untangle, and the benefits tend to remain within a society (except in ways that are easier to untangle). The fact that national standards of living tend to correlate with cumulative past emissions is evidence of this. Third, because the economic benefits of consuming the emissions budget remain largely within a society, it would be better to count an individual's "excess consumption" against her society's quota, rather than against humanity's as a whole. Doing so, however, means that emissions are effectively distributed over societies rather than individuals. Finally, different societies might reasonably disagree about what constitutes a just distribution of emissions within their society. An international agreement that allocates emissions directly to individuals would, in effect, override each society's right to determine for itself how it wants to distribute emissions.<sup>9</sup>

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<sup>9</sup> I articulate this argument in more detail in an unpublished manuscript.

### 3.2. *We have not yet spent the entire emissions budget*

Some recent estimates give humanity about 400 more gigatons of carbon (GtC) to emit before we are more likely than not to exceed 2° C warming.<sup>10</sup> Since 2° C is a widely used benchmark, it provides a convenient standard for thinking about the risk threshold that defines the size of the emissions budget. The recent “aspirational” goal of 1.5°C, adopted at Paris in December 2015, would entail an even smaller emissions budget.

From a different perspective, it may seem that we have already exhausted the emissions budget. The last 250 years’ worth of emissions have already committed the planet to significant climate change, regardless of future emissions. Even in the best-case scenario, this will seriously harm tens or hundreds of millions of people. Many of these people—particularly the most vulnerable, who will have contributed almost nothing to the problem—will die, be made homeless, face serious illness, or suffer other serious hardships. As John Nolt says, the honest question is not how much more risk we should accept, but how many more casualties we should accept.<sup>11</sup> From such a perspective, the answer might seem to be: none. And if that is our answer, then we have already spent the entire emissions budget.

There are still two reasons, however, for thinking about how to allocate an emissions budget. First, no international agreement will mandate the immediate cessation of all emissions—or even all luxury emissions. Rather, any international agreement that manages to cap emissions will entail a sizeable emissions budget. The question of allocating *that* emissions budget fairly will still arise and is worth considering.

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<sup>10</sup> Friedlingstein et al. 2014. See also: Allen et al. 2009; Meinshausen et al., 2009. Note that the emissions budget is often expressed in terms of gigatonnes of CO<sub>2</sub>, which is equivalent to about 0.27 GtC; and sometimes in terms of petagrams of carbon (PgC), which are identical to GtC.

<sup>11</sup> Nolt, 2015.

Second, we might take non-ideal theory to be more important here than ideal theory, and non-ideal theory arguably entails that we should accept a less stringent agreement.<sup>12</sup> Protecting people against the tremendous harms of “business as usual” might require accepting an agreement that would still allow significant harm; there might be no other realistic way to entice recalcitrant states into an agreement. If that is true, then perhaps we ought to accept more risk than we have already created.

### *3.3. We do not need a full theory of global distributive justice*

Simon Caney argues that we should think about the allocation of emissions rights from an “integrationist” perspective—that is, “in conjunction with considerations about global and intergenerational justice in general.”<sup>13</sup> Since distributive justice is concerned with the “fair share of a ‘total package’ of goods,” each person’s fair share of emissions rights depends on what other goods he or she has. It would be silly to develop a specific principle for the just distribution of, say, apples or cars, without reference to the ideal or existing distributions of food, money, access to and need for transportation, etc. Likewise, Caney argues, there is no good reason to develop a specific principle for the just distribution of emissions rights.<sup>14</sup> Furthermore, since one could redistribute other resources to compensate for different distributions of emissions rights, there is no single allocation that is “*the* fair distribution of greenhouse gases.”<sup>15</sup> Thus, anyone who adopts such an “isolationist” approach, as Caney calls it, must justify the development of a specific principle for the allocation of just emissions.

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<sup>12</sup> On the distinction between ideal and non-ideal theory, see Valentini, 2012.

<sup>13</sup> Caney, 2012: 259.

<sup>14</sup> Caney, 2012: 271*ff.*

<sup>15</sup> Caney, 2012: 271.

This paper's main argument seems open to Caney's challenge. The argument does not appeal to a theory of global distributive justice. It does not refer to the ideal or existing global distribution of resources. It does not contemplate the redistribution of other kinds of resources. On the surface, the argument appears to take an isolationist approach.

In fact, though, the argument already integrates concerns about the existing distribution of resources by making the distribution of emissions rights sensitive to desert and need. Desert and need capture both diachronic and synchronic aspects of distributive justice. If the global distribution of resources were very different, then the Proportional Claims Account would have different implications for the distribution of emissions rights, for most countries' needs would be very different than they are now. Since Caney's arguments against isolationism rest on the idea that the distribution of emissions must be sensitive to broader questions of distributive justice, those arguments do not undermine the approach taken in this paper.

The main argument also avoids Caney's challenge because it does not specify "*the* fair distribution" of emissions rights. Rather, it only shows that, given feasibility constraints on redistributing other resources, any fair allocation of the emissions budget falls within a certain definable range. If it is feasible to redistribute enough resources to compensate for an anti-prioritarian allocation of the emissions budget, then the main argument of this paper fails as stated. It may be possible to tweak the argument to avoid this difficulty—for instance, by arguing that in the event of an adequate global redistribution of resources, an equal per capita view would correctly allocate a windfall good such as the emissions budget or by arguing that the redistribution of other resources *for the purpose of rectifying climate injustice* would amount to the developed countries' purchasing a share of the emissions budget from developing countries. The exact modifications would depend on the details of the redistribution.

At any rate, the history of intergovernmental development assistance and international climate negotiations give little reason to think such redistribution is feasible. Even the developed countries' recent commitment to mobilize \$100 billion per year in climate finance<sup>16</sup> is underwhelming. If they follow through on their commitment and that \$100 billion is truly additional to existing development assistance, then it would approach rich countries' current levels of official development assistance,<sup>17</sup> but it would be just a quarter of private foreign direct investment in developing countries each year,<sup>18</sup> less than an eighth of annual exports from the least developed countries,<sup>19</sup> and less than one half of one percent of total international trade each year.<sup>20</sup> Such climate finance will surely help developing countries cope with climate change, but it will not significantly alter the global distribution of resources.

By being sensitive to desert and need without engaging theories of distributive justice directly, the main argument of this paper also enjoys considerable practical advantages over a more explicitly integrationist approach. Caney raises some practical worries about the integrationist approach, but he thinks the approach can cope with them. His suggestion for doing so overlaps with the approach adopted here: Caney worries that conditioning a mitigation agreement on agreement about global distributive justice is a “recipe for deadlock.”<sup>21</sup> In response, he notes that we could avoid that deadlock by focusing on a “Minimal theory of global distributive justice,” rather than a “Maximal” theory. He says that

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<sup>16</sup> United Nations Framework Convention on Climate Change, 2015: ¶53

<sup>17</sup> OECD, 2015: Table 1.

<sup>18</sup> OECD, 2015: Table 1.

<sup>19</sup> World Trade Organization, 2014: 42.

<sup>20</sup> World Trade Organization, 2014: 23, 123.

<sup>21</sup> Caney, 2012: 277.

a Minimal theory “seeks to identify what is absolutely essential” to achieving global justice.<sup>22</sup>

The approach adopted here demands even less agreement: The central argument requires agreement on only specific aspects of a Minimal theory of justice.

#### **4. Defending the key premises of the main argument**

The main argument of this paper, given in §2, relies on three key premises. Premise (1) asserts that developing countries deserve at least as great a share of the emissions budget as developed countries do, on a per capita basis. Premise (2) asserts that developing countries have a greater need for emissions than developed countries do, on a per capita basis. Premise (3) asserts that existing agreements do not generate any entitlements to shares of the emissions budget. With regard to premise (3), the only significant prior agreement is the Framework Convention on Climate Change and its institutional penumbra. While it recognizes “common but differentiated responsibilities” for tackling climate change and says that “the developed country Parties should take the lead in combating climate change,” two decades of political wrangling suggest that neither the Convention nor any subsequent agreements constitute a clear agreement on how to allocate the budget. Thus, I will focus my arguments in this section on the premises about desert and need.

##### *4.1. What defensible theories of desert entail about emissions*

The Proportional Claims Account by itself does not settle the question of how strong each country’s desert-based claim is. To determine the strength of various countries’ desert-based claims, we need to make some further assumptions about desert. We do not need a full-blown

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<sup>22</sup> Caney, 2012: 278.

theory of global distributive justice to determine which states have stronger desert-based claims on the emissions budget. This is because the hard questions of distributive justice mostly involve sharing the benefits of social cooperation. The emissions budget is not a product of social cooperation; it is a windfall good—a resource that (legitimately) comes into someone’s possession without their having done anything to create, acquire, or otherwise deserve it.

In the following subsections, I identify four competing sets of assumptions about (non-need-based) desert and trace their implications for the fair division of the emissions budget. The sets differ with respect to their assumptions about the relevance of historical emissions (often taken to be emissions prior to 1990) and about how windfall goods should be allocated. I aim to show that three of these sets entail that developing countries’ desert-based claims are at least as strong as developed countries’ claims, on a per capita basis, and that while the fourth set entails the opposite conclusion, it is not defensible in the case of the emissions budget. Since all three remaining sets point in the same direction, we can conclude that developing countries’ desert-based claims are at least as strong as developed countries’ claims, even without choosing between those three.

I will discuss each of these sets of assumptions strictly from what Shelly Kagan calls “the point of view of desert.”<sup>23</sup> That is, I will consider only whether the assumptions provide a defensible account of *desert*-based claims on the emissions budget. These assumptions fail to capture everything that is relevant to the all-things-considered, morally best allocation of the emissions budget; but insofar as those reasons are not related to desert, they are irrelevant here.

#### *4.1.1. Equal per capita distribution; no historical accountability*

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<sup>23</sup> Kagan, 2012: 27–30.

Let the “pure equal per capita view” about desert consist of two assumptions: that when dividing windfall goods, each country deserves an equal share, on a per capita basis; and that states’ historical emissions are irrelevant to how much of the emissions budget each country deserves. Thus, everyone’s desert-based claim on the budget is equally strong. Often, this view rests on the idea that each individual has an equal desert-based claim on the emissions budget, since it is a global natural resource that cannot be claimed by any particular persons or countries.<sup>24</sup>

Several authors have criticized the view that, all things considered, each state should receive an equal per capita share of the emissions budget.<sup>25</sup> Their criticisms, however, are mostly based on differing levels of need across countries. As such, they are irrelevant to the narrower question about whether each country has an equal (non-need-related) desert-based per capita claim on the emissions budget.

#### *4.1.2. Equal per capita distribution; historical accountability*

Let the “historically sensitive equal per capita view” consist of two assumptions: that when dividing windfall goods, each country deserves an equal share, on a per capita basis; but that each country’s share is to be reduced in proportion to (some share of) its historical emissions.<sup>26</sup> One simple version of this view is that each country receives an equal share of the pre-industrial emissions budget, adjusted for population size (in some reference year), and that all emissions since some date (e.g., 1850) are to be deducted from that initial share. A more nuanced version might deduct only those emissions above some subsistence level. Different versions of this view might count different time periods as the relevant historical

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<sup>24</sup> See, e.g., Vanderheiden, 2008; Broome, 2012: 70; Moellendorf, 2011.

<sup>25</sup> See, e.g., Caney, 2012; Bell, 2008; Miller, 2008.

<sup>26</sup> The canonical version of this view is in Neumayer, 2000.

period (e.g., 1850–1990, 1990–2005, etc.) or use different formulas for determining how historical emissions affect each state’s desert-based claims, but to count as a version of this view, historical emissions must weaken a state’s desert-based claims to the remaining emissions budget. Since (most) developed countries have far greater historical emissions than (most) developing countries, on a per capita basis if not absolutely, this view entails that the developing countries’ desert-based claims are stronger than the developed countries’ claims.

Historical accountability is controversial. Many commentators have criticized it on both normative and pragmatic grounds.<sup>27</sup> In general, the normative criticisms treat the case for historical accountability as one of corrective justice. Advocates of historical accountability have attempted to rebut those criticisms head-on<sup>28</sup> or sidestep them by shifting the argument from one of corrective justice to one of distributive justice.<sup>29</sup> The normative issue remains unsettled.

#### *4.1.3. Equal per capita distribution; Lockean historical accountability*

Let the “Lockean equal per capita view” consist of three assumptions: windfall goods are initially common property, which each country may appropriate through any legitimate means of acquisition; that when enclosing a windfall good that was formerly common property,<sup>30</sup> each country deserves an equal per capita share of the newly enclosed resource; but that each country’s share is to be reduced in proportion to its *illegitimate* historical emissions, if any. This view is Lockean in that it assumes that resources are naturally

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<sup>27</sup> Caney, 2006; Halme, 2007; Posner and Weisbach, 2010; Page, 2011; Schüssler, 2011.

<sup>28</sup> Neumayer, 2000; Gardiner, 2004; Vanderheiden, 2008; Soltau, 2009; Pickering and Barry, 2012.

<sup>29</sup> Moellendorf, 2014: 172.

<sup>30</sup> To “enclose” a resource that was previously common property is to assign property rights in the resource, excluding everyone else from using the enclosed portion of the resource.

common property, and that each claimant has a natural right to acquire some of that common property by, e.g., mixing his or her labor with it, within some limit.<sup>31</sup>

The obvious question about such an account is how to distinguish legitimate from illegitimate acquisition of the emissions budget. We can discern what this view entails, in broad outline, without answering that question precisely. Because this view assumes that when enclosing a windfall good, each country initially deserves an equal per capita share, the only condition under which some countries' claims could be stronger than others is if some countries' historical emissions amounted to the illegitimate acquisition of part of the emissions budget. The standard Lockean account of legitimate acquisition is that each claimant leave "enough and as good" in common for others to acquire.<sup>32</sup> Arguably, now-developed countries have not left "enough and as good" for others, since other states can no longer develop using fossil energy without seriously destabilizing the climate. Even without specifying a precise account of leaving "enough and as good" for others, it is clear that if any countries have violated this "Lockean proviso," developing countries' violations would be less than developed countries' violations. So, if any countries have violated the proviso, that would strengthen developing countries' claims relative to developed countries' claims. If no country has violated the proviso, each countries' desert-based claim would be equally strong. Thus, imposing Lockean historical accountability on an otherwise equal per capita view of desert entails that developing countries' desert-based claims are at least as strong as developed countries' claims.

#### *4.1.4. Grandfathering distribution; no historical accountability*

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<sup>31</sup> See Locke, 1689: Ch. 5; Nozick, 1974: 174–82.

<sup>32</sup> Nozick, 1974: 178ff.

Let the “grandfathering view” consist of two assumptions: that when enclosing a windfall good that is already being used by various countries at different rates, each country deserves a share of the good that is roughly proportional to its share of current use; and that historical emissions are irrelevant to how much of the emissions budget each country deserves.<sup>33</sup> On this view, currently high-emitting countries (including developed countries) enjoy a much stronger desert-based claim on the remaining emissions budget than low-emitting states do.

Grandfathering approaches differ in how much weight they place on current emissions rates. Some approaches treat the fact that one country currently emits more than another as a conclusive reason to allocate more of the budget to the first state than the second. Others treat the difference in emissions rates only as a *pro tanto* reason to grant more emissions rights to the first country than the second. Carl Knight calls these approaches strong and moderate grandfathering, respectively. As Knight argues, moderate grandfathering is a much more plausible normative principle than strong grandfathering is.<sup>34</sup> Let us assume, then, that the current position involves only moderate grandfathering. If that is indefensible from the perspective of desert, then any variation involving strong grandfathering will be indefensible as well.

Some arguments for grandfathering rely on historical precedents for or hypothetical examples of enclosing other kinds of commons, such as pastures or lakes.<sup>35</sup> Bovens, for instance, imagines a lake that becomes overcrowded with boats. It would be morally defensible, Bovens argues, to prevent further overcrowding by granting the current boat

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<sup>33</sup> A related position combines grandfathering with Lockean historical accountability. If the arguments in this subsection succeed, however, that view is as implausible as grandfathering without historical accountability.

<sup>34</sup> Knight, 2013.

<sup>35</sup> Posner and Weisbach, 2010; Bovens, 2011.

owners tradable permits to launch a boat of whatever size they currently own. Those who want to add a new or bigger boat to the lake must buy the right to do so from a current permit holder. Indeed, Bovens claims, such a scheme would be morally preferable to issuing permits for equally sized boats to everyone who wants one, even those who do not currently own a boat. By analogy, it would be morally preferable (from the perspective of desert) to grant developed countries the right to emit at higher *per capita* rates than developing countries, rather than at equal per capita rates.<sup>36</sup>

Though Bovens makes a strong case for a grandfathering approach to managing his imaginary lake, his analogy is implausible when it comes to desert-based claims about the emissions budget. The story of the lake suggests policy-relevant reasons for enclosing a commons in the way that Bovens suggested: First, when some have invested in infrastructure for using the commons, reallocating the commons to undermine that investment would harm those who rely on that investment. Relatedly, setting a precedent that ignores current rates of use would reduce the incentive to invest in productive uses of common resources. Finally, allocating permits to everyone who wants to use the resource (as opposed to merely wanting a valuable permit to resell) creates informational problems. These reasons, however, have nothing to do with (non-need-related) desert; they have to do with need and efficiency. Thus, while those reasons might affect our all-things-considered judgment about how to allocate the emissions budget, they should not affect our judgment about the strength of various countries' desert-based claims.

#### *4.1.5. Summarizing the argument about desert*

In the preceding subsections, I examined four sets of assumptions about each country's desert-based claims to the emissions budget. These four views dominate the literature on

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<sup>36</sup> Bovens, 2011.

climate equity.<sup>37</sup> Three of the views—the “equal per capita view,” the “historically sensitive equal per capita view,” and the “Lockean equal per capita view”—entail that developing countries’ desert-based claims, adjusted for population size, are at least as strong as developed countries’ claims, which was the first premise of my main argument. The fourth view—the “grandfathering view”—entails that developed countries have the stronger desert-based claim, but I argued that this view is implausible with respect to the emissions budget.

#### *4.2. What defensible theories of need entail about emissions*

Showing that developing countries have a stronger needs-based claim to the emissions budget requires less work because theories of need differ in fewer relevant ways. Theories of need come in two kinds, each capturing different sense of the term *need*: One kind defines needs in terms of harms, so that someone needs (to do) something just in case going without (or not doing) that thing would necessarily harm that person.<sup>38</sup> The notion of necessity used here prominent account is a vague, non-technical one: Roughly, *S* will necessarily suffer harm in circumstances *c* just in case the probability of *S*’s avoiding harm in *c* is so low as to be practically unavoidable, regardless of what the agent does. (This kind of necessity rules out cases where someone would actually suffer harm if denied some good, but only because he or she would forgo feasible steps to prevent that harm.) The other kind of theory of need identifies “needs” with “basic needs,” defined either as those things without which one cannot live a decent life or those things without which one cannot develop or maintain autonomous agency.<sup>39</sup> These kinds of theories, which we might call “harm-based theories” and “basic needs theories,” respectively, overlap in many cases. For instance, both entail that

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<sup>37</sup> Mattoo and Subramanian, 2012.

<sup>38</sup> Wiggins, 1987.

<sup>39</sup> Braybooke, 1987; Reader, 2005.

everyone needs water. They diverge in cases where harms do not threaten someone's autonomous agency. For instance, an avid recreational sailor might need "relief from slooplessness" if her sailboat sinks, but only in the sense that she will be worse off if she cannot replace it; her loss does not impair her autonomous agency. This subsection argues that these kinds of theories overlap in the case of emissions rights. Each entails that developing countries have a stronger needs-based claim on the emissions budget than developed countries do.

The approach adopted here for comparing countries' need for emissions is to consider in a qualitative way what would happen if each state were to reduce its emissions to near zero<sup>40</sup> within, say, two or three decades, which is faster than under virtually any mitigation scenario studied by the Intergovernmental Panel on Climate Change.<sup>41</sup> The relevant questions for each theory are how much each state would be harmed by such reductions and how many basic needs would go unmet.

Because the effect of eliminating emissions depends on the resources available to each country, this approach implicitly accounts for factors that motivate Caney's integrationist approach to climate justice: It accounts for different levels of wealth and, if pursued in enough detail, would account for each country's access to wide and narrow substitutes for fossil fuels.<sup>42</sup> Thinking about the need for emissions therefore achieves what

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<sup>40</sup> The argument does not depend heavily on this extreme target, although it is easiest to state the argument in these terms. Each step of the following argument could be fairly easily modified to fit other plausible targets (e.g., a rapid contraction-and-convergence scenario in which countries diminish or increase their emissions, as appropriate, to reach a uniform level of per capita emissions over two or three decades).

<sup>41</sup> Clarke et al., 2014: 432.

<sup>42</sup> On the distinction between wide and narrow substitutes, see: Caney, 2012: 283ff.

Caney wants from an integrationist approach without requiring substantive theoretical commitments about global distributive justice.

Harm-based theories of need entail that developing countries, taken collectively, have a greater need for emissions than developed countries do. Both developed and (most or all) developing countries would necessarily suffer economic losses from rapid decarbonization. Because of the diminishing marginal utility of income and wealth, those losses would cause greater suffering in developing countries than in developed countries. Thus, developing countries have a greater need for emissions. In more detail, this argument is as follows.

Both developed and (most or all) developing countries would necessarily suffer if they were to eliminate emissions within two or three decades. In countries that already have large carbon footprints, this is for three main reasons: First, the energy supply sector would face high costs from decarbonization. This is partly because, in most places, producing energy from fossil fuels is cheaper than producing it from renewable sources. Also, rapid decarbonization would require retiring many power plants prematurely and investing large amounts of financial capital in new power plants.<sup>43</sup> At least some of these costs would be passed on to consumers, leaving households and firms with less money to spend on other goods and services. Second, households and firms would need to replace certain durable goods, including automobiles, gas-fired furnaces, and so on, sooner than they otherwise would and perhaps with more expensive alternatives. In many poorer countries, there is a third reason: Land use changes, such as clearing tropical forests for agricultural use, account for a significant amount of net emissions in countries like Brazil and Indonesia. Curtailing

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<sup>43</sup> This is a key element of Knight's argument for moderate grandfathering. Thus, the justification for moderate grandfathering appeals to need, not desert. The present argument takes Knight's argument on board, but maintains that the needs of developing countries still exceed the needs of the developed countries. See: Knight, 2014.

that land-use change would impose significant costs on the households and firms that benefit from such practices. In principle, developing countries could make these changes without suffering large losses if the developed countries provided huge amounts of financing and technical help. Since such transfers are very unlikely, rapid decarbonization would necessarily harm developing countries. This qualitative assessment does not allow us to determine any country's loss of income in absolute terms, but the World Bank estimates that in order to meet aggressive mitigation targets, many developing countries, including China and India, would have to spend a larger proportion of their national income on mitigation than the largest developed-country polluters would.<sup>44</sup> This suggests that developing countries would face a proportionally larger financial burden than developed countries would.

Even if developing countries would not face a larger financial burden, they might still suffer greater harm because of the diminishing marginal utility of wealth and income. To say that income has diminishing marginal utility is to say that as one's income increases, each additional unit of income adds less to one's well-being. This implies that taking a dollar from a poor person does more harm than taking it from a rich person. Therefore, an equal loss of income by a poorer country and a richer country—either absolutely or proportionally—does more harm in the poorer country. In fact, given the large difference in incomes between developed countries and most developing countries, developed countries' financial losses would need to greatly exceed developing countries' losses for developed countries' loss of utility to exceed developing countries' loss of utility.<sup>45</sup> Going without emissions, then, would

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<sup>44</sup> World Bank, 2010: 199–203.

<sup>45</sup> To put some rough numbers on this assessment, consider the recent estimate of the marginal utility of income by Richard Layard and his colleagues, based on a number of happiness surveys across different countries. Layard *et al.* found a remarkably consistent estimate of the ratio of changes in income to changes in utility. Early economists assumed that utility increases in inverse proportion to

harm developing countries more than developed countries unless going without emissions would cause a much larger loss of income—*both* absolutely and proportionally—in developed countries than in developing countries.

Accounting for countries that currently lack a significant carbon footprint requires further normative assumptions about which comparisons are appropriate. Some countries are currently both very poor and very low emitters. If such countries reduced their emissions to near zero, their per capita incomes would not fall very much relative to current levels. However, if reducing their emissions to zero (which means forgoing future emissions increases) slowed their economic development, it might decrease their incomes significantly relative to what they would have been without the emissions reductions. For such countries, then, the strength of their need for emissions depends significantly on whether we take current income or counterfactual future incomes as the baseline. The argument of the preceding paragraph applies to such countries only on the assumptions that harm should be assessed relative to future incomes under “business as usual” increases in emissions and that such countries’ economies would actually grow over the next few decades. The baseline question is also important for thinking about high-emitting developing countries, since their

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income, so that someone earning \$1,000 receives ten times as much utility from an extra dollar as does someone earning \$10,000 and a hundred times as much as someone earning \$100,000. Layard *et al.* estimate that marginal utility falls somewhat more quickly than that, so that someone earning \$1,000 receives *more* than ten times as much utility from an extra dollar as does someone earning \$10,000. Using this estimate, the loss in utility to the average American would roughly equal the loss in utility to the average Chinese if American per capita income fell by a quarter and Chinese per capita income fell by fifteen percent; or if American per capita income fell by half and Chinese per capita income by a third; and so on. See: Layard, Nickell and Mayrax, 2008.

losses will be even greater if assessed against counterfactual future incomes than against current income.

Either of two assumptions will therefore entail that on harm-based theories of need, developing countries have a stronger need-based claim on the emissions budget. Specifically, this conclusion follows from either the assumption that we ought to take future incomes as the baseline or that, using current incomes as the baseline, the combined loss of utility in developing countries would exceed the combined loss of utility in developed countries. It seems likely that at least one of these assumptions is correct.

Turning from harm-based to basic needs theories of need, we need to assess the impact of rapid decarbonization on the satisfaction of people's basic needs. On such theories, developing countries' need-based claims are stronger because developed countries could satisfy more of their inhabitants basic needs while eliminating emissions than developing countries could. This is not to deny that eliminating emissions so quickly would be painful for developed countries. As discussed above, rapid decarbonization would impose steep costs on households and firms. But even if today's inhabitants of developed countries were reduced to the economic levels of their grandparents—which would correspond to an extremely pessimistic forecast of the costs of rapid decarbonization—most people could still meet their basic needs; in general, their grandparents exercised autonomous agency and lived at least minimally decent lives (except when war, tyranny, or other non-economic forces intervened). Furthermore, developed countries could afford to redistribute wealth internally to ensure the satisfaction of their residents' basic needs, although this is more politically feasible in some countries than in others.

In poorer countries, the story is different. Many inhabitants of developing countries—and especially the least developed countries—cannot meet their basic needs now. Others are barely doing so. Eliminating emissions would slow or reverse economic growth for decades

to come. Without economic growth, the global poor's prospects look dim. With economic decline, the number of people who cannot meet their basic needs would swell. While it is technically possible that enormous technological and financial transfers from the developed countries could enable the global poor to meet their basic needs without substantial emissions (e.g., through the financing and construction of renewable energy sources), such transfers are so unlikely that they are irrelevant for present purposes. Thus, on basic needs theories, developing countries have a stronger need-based claim on the emissions budget than developed countries do.

Note that on either kind of theory of need, a country's need for emissions is proportional to its population size. The relationship between need and population size might not be exactly linear, since there may be increasing returns to scale. But China, for instance, needs more emissions than Chad simply because there are far more Chinese.

Thus, both harm-based and basic needs theories of need entail that developing countries have a stronger need-based claim on the remaining emissions budget than developed countries do, adjusted for population size. This vindicates the second premise of this paper's central argument.

## **5. National differentiation**

The argument so far relies on the crude categorical distinction between developed and developing countries. It is worth considering how the picture changes if we consider each country individually.

For relatively poor countries with relatively high cumulative per capita emissions (or richer countries with relatively low emissions), desert and need could conceivably come

apart. Based on an analysis of data from the World Resources Institute,<sup>46</sup> there are probably fewer than a dozen countries for which this looks to be true independently of one's conception of desert or need: Malaysia, Chile, Cuba, Turkey, Uruguay, Mauritius, South Africa, Turkmenistan, and Ukraine, as well as a handful more that are borderline cases (e.g., Libya, Lebanon, and Bulgaria).<sup>47</sup> With three exceptions, these countries represent a small share of global cumulative emissions and global population; and even the three exceptions—Turkey, South Africa, and Ukraine—represent only about 0.5 percent or 1 percent of cumulative emissions each. There are another few dozen countries where desert and need point in opposite directions depending on one's conception of desert. In most of these cases, historical sensitivity is what matters. For instance, many poorer tropical countries have, through deforestation, emitted more than average in the last quarter century, and so if we look only at emissions after 1990, these countries count as relatively high emitters, adjusted

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<sup>46</sup> My analysis here draws on data from the World Resource Institute's CAIT Climate Data Explorer and the United Nations Development Programme's *Human Development Report*. Briefly: I divided each country's cumulative CO<sub>2</sub> emissions since 1850 (excluding emissions from land-use change) by its population size in 2012. I then divided each country's cumulative CO<sub>2</sub> emissions since 1990 (including emissions from land-use change) by its population size in 2012. This yields two estimates of per capita emissions—one historically sensitive, the other not. These served as proxies for desert, on the assumption that *ceteris paribus*, countries that have emitted more deserve less (and vice versa). I used GDP per capita from 2014 as a proxy for need, on the assumption that *ceteris paribus*, countries with lower GDP per capita (adjusted for purchasing power) have greater need than those with greater GDP per capita. The original data is available from World Resources Institute 2014; and, in the case of GDP data, from United Nations Development Programme 2015.

<sup>47</sup> These eleven countries had *either* below-average cumulative emissions, whether measured from 1850 or 1990, but above-average GDP per capita; *or* above-average emissions, measured from either date, and below-average GDP per capita.

for population size. But of the few dozen countries in which desert and need sometimes come apart, only Argentina, Brazil, Iran, and Indonesia emitted more than half a percent of global cumulative emissions. Brazil and Indonesia have each contributed over 4 percent of global cumulative emissions since 1990, and could therefore constitute important exceptions to any generalization about the fairness of an agreement. The bottom line, however, is that with a relatively small number of mostly minor exceptions, the crude categorical distinction between developing and developed countries is good enough for the purposes of the present argument.

Many people might be curious about how China fares when considered alone. Might desert and need point in different directions in the Middle Kingdom, such that we need to settle on a particular account of fairness to determine whether China should get more or less than developed countries? If they did, this could make a big difference in the overall assessment of a global agreement; but they do not. Despite China's rapid growth over the last few decades, its cumulative emissions, adjusted for population size, are still below the world average.<sup>48</sup> Accounting for emissions prior to 1990 would only tilt the balance more in China's favor, relative to the developed countries. On any of the defensible accounts of desert from Section 4.1, then, China deserves at least as much as most of the developed countries. Similarly, although China's Human Development Index has soared from 0.423 (out of 1.0) in 1980 to 0.719 in 2013, it still ranks only 90th in the world, well outside the group of countries that enjoy "very high human development,"<sup>49</sup> and its GDP per capita (adjusted for

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<sup>48</sup> Based on data from the World Resources Institute, China emitted about 13.4GtCO<sub>2</sub>e between 1990 and 2012. Dividing by a population of 1.35 billion in 2012, that yields per capita cumulative emissions of about 98.2 tCO<sub>2</sub>e. By contrast, the world as a whole emitted some 89.4GtCO<sub>2</sub>e during that interval, or about 126.9 tCO<sub>2</sub>e per person.

<sup>49</sup> United Nations Development Programme 2015, Statistical Annex, Table 1

purchasing power) was \$12,547 in 2014, a bit below average. Taking either human development or GDP as a proxy for need, this suggests that China has a stronger need-based claim on the emissions budget than any of the developed countries do. Thus, the Proportional Claims Accounts entails that, adjusting for population size, China still deserves a greater share of the emissions budget than developing countries do.

Since the crude categorical distinction between developing and developed countries is good enough to get the broad outlines of justice right, and that most of the errors involve relatively minor cases; and relying on the cruder distinction does not mislead us in the critical case of China, I conclude that relying on the cruder distinction does not significantly distort the overall conclusion of the argument.

## **6. Implications for international agreements on mitigation**

The preceding arguments, if sound, show that on the correct view—whatever it is—a fair allocation of the budget would give at least as much of the budget to developing countries as to developed countries, on a per capita basis. Furthermore, the preceding arguments show that this conclusion follows from very weak assumptions about the nature of fairness.

Given the constraints of international politics, the differences between various Equal Per Capita and Prioritarian views are insignificant. Even the Equal Per Capita view without historical accountability is politically infeasible. An agreement embodying that view would give too little to the developed countries for them to accept it. It would also violate many developing countries' insistence on historical accountability—though adding historical accountability would only make it less palatable to developed countries. By showing that all plausible principles for fairly allocating the emissions budget lie in the same direction and that they are all out of reach, the climate justice literature shows all that negotiators need to

know about fairness: The fairest allocation they will be able to manage is the one that gives as much of the emissions budget to the global poor as political constraints allow.

Fairness in the international distribution of the emissions budget, however, is only one desideratum in an international mitigation agreement. Others, such as setting appropriate limits on emissions, allocating the burdens and benefits of adaptation appropriately, and mitigating efficiently, may pull in other directions. Thus, the literature on fairness does not tell negotiators everything they need to know about what the normatively best international agreement would look like, all things considered. But solving even one piece of the climate justice puzzle is progress.<sup>50</sup>

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