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for an equal per capita allocation

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Abstract

Emissions rights are commodities and many hold that these commodities (or alternatively the revenue from their auction) should be allocated to (adult) individuals on an equal per capita basis. Proponents of this equal per capita allocation (EPCA) often argue for it on the grounds that the atmosphere or greenhouse gas emissions sinks are a “commons”. But how can we assess the strength of these “commons arguments” for EPCA? As most of those making such arguments do not have a background in academic philosophy, their arguments are not grounded in the philosophical literature on justice - a literature that seeks to provide a specification and justification of what constitutes a fair distribution of resources within society. This paper therefore seeks to set out clearly the various commons arguments for EPCA and to assess what, if any, support can be found for them within the justice literature. To make the various commons arguments as clear as possible, and to make analysis of these arguments as straightforward as possible, they are set out formally i.e. as premises followed by a conclusion. The conclusion of the analysis is that there is little support within the justice literature for these commons arguments for EPCA.

1. Introduction

1.1. *Commodities, commodification and emissions rights*

According to Kaveny (1999) a commodity is something that has a price, is fungible and is of instrumental rather than intrinsic value. By this definition, fossil fuel is clearly a commodity. I take commodification to be the process by which something originally not a commodity becomes one and, as commodities are subject to market exchange, to involve the creation of markets. And as fossil fuel has been exchanged in markets for centuries, its commodification is clearly not a recent phenomenon.

Fossil fuel combustion produces greenhouse gases which become greenhouse gas *emissions* when they are released to air (UNFCCC 1992: Article 1). Emissions from fossil fuel combustion are the single largest source of greenhouse gas emissions and reducing them is, thus, a key component in overall emissions reduction. Of course, fossil fuel combustion need not result in emissions as the greenhouse gases produced can be captured and stored. However, given the nascent state of carbon capture and storage (CCS) technology, a significant proportion of fossil fuel emissions reduction will have to be achieved by reducing combustion rather than simply increasing CCS.

Let's say that the current quantity of fossil fuel combusted is FF which leads to quantity E of emissions. Further, let's say that emissions must be reduced from E to E* which, after the contribution of CCS, requires a reduction in fossil fuel combusted from FF to FF*. One way of achieving this is to tax fossil fuel so that the quantity demanded falls to FF* and another is to issue a quantity of *stand-alone* emissions rights that allow emissions of no more than E* (and, thus, combustion of no more than FF*). Regimes under which such rights are traded are known as *emissions trading schemes*, a name that is perhaps a little misleading given that what are being traded are not emissions themselves but emissions rights i.e. the right to emit.

The term *stand-alone* is important here for, clearly, the right to emit also exists under a carbon tax. That is to say, a key right associated with ownership of fossil fuel purchased under a carbon tax regime is the right to combust it and release the greenhouse gases produced to atmosphere. But note that under a carbon tax, one has this right only if one owns fossil fuel. However, under an emissions trading scheme, rights to emit carbon are owned independently of fossil fuel and, thus, can be traded separately. But whilst these stand-alone emissions rights are clearly a commodity, no process of commodification has taken place as these rights never existed in non-commodity form.

1.2. *The commons and fair allocation*

What would constitute a fair initial allocation of this commodity within an emissions trading scheme that included all nations of the world?¹ One answer is provided by the well-known *Contraction and Convergence* proposal (Meyer 2000) developed in the early 1990s. Under *Contraction and Convergence*, the nations of the world converge to a situation under which rights to the contracting quantity of permitted global emissions are allocated on an equal per capita basis. That is to say, they converge to a situation under which the quantity of available emissions rights allocated to each of them in a given year is calculated by dividing the rights to the permitted global emissions for that year by the global population in that year (or an agreed base year) and then multiplying this quotient by each nation's population in that year (or the base year) (Meyer 2004).

¹ Note that this paper only addresses the issue of a fair allocation *within* generations. For a discussion of fairness *between* generations in relation to climate change see, for example Caney (2008, 2009).

Similarly, from the early 1990s, emissions trading schemes within nations have been proposed under which some or all of the rights covering fossil fuel emissions are allocated to adult individuals on an equal per capita basis (Carley et al. 1991: 39, Fleming 1996, Ayres 1997). These so-called *personal carbon trading* schemes have been the focus of some interest within the UK (Defra 2008).

Alternatively, Barnes (2001) has proposed a national emissions trading scheme under which the rights covering fossil fuel emissions are auctioned to fossil fuel suppliers with the auction revenue allocated to adult individuals on an equal per capita basis. (In other words, rather than adult individuals being allocated emissions rights, they are allocated the revenue from the sale of those rights.) And note that it would be possible to reduce emissions by levying a carbon tax on fossil fuel suppliers and, similarly, allocating the tax revenue to adult individuals on an equal per capita basis. In this paper, I take the equal per capita allocation to adults of emission rights, auction revenue and tax revenue (henceforth “rights and revenue”) to be broadly equivalent. For a further discussion, see Starkey (2009).

Arguments in support of allocating rights between nations on an equal per capita basis and of allocating rights or revenue within nations to adults on an equal per capita basis² are often based on the premise that the atmosphere or sinks for greenhouse gases emissions are a “commons”. But how might one explore whether these “commons arguments” for an equal per capita allocation (EPCA) are, in fact, good arguments? The majority of those advocating EPCA are not versed in the philosophical literature on justice - a literature that seeks to provide a specification and justification of what constitutes a fair distribution of resources within society - and, thus, one answer to the question, and the approach adopted here, is to explore what support for EPCA can be found within the justice literature.

The paper proceeds as follows. Section 2 gives some examples of commons arguments for EPCA whilst Section 3 contains a brief discussion of the notion of ownership which allows two very different uses of the term *commons* to be distinguished in Section 4. Section 5 and 6 set out arguments for EPCA based on this first use of the term and explore what philosophical support exists for such arguments. Sections 7 and 8 do the same with regard to the second use of the term and Section 9 concludes.

Given the undoubted power of the notion of the (global) commons within climate change discourse (and environmental discourse more generally) and the considerable constituency in favour of EPCA, it is hoped that this exploration of commons arguments will contribute to discussion of the important question of what constitutes an equitable approach to emissions reduction.

2. Commons arguments for EPCA

Some advocating EPCA simply assert the rightness of the allocation. For example, in endorsing Contraction and Convergence, the Royal Commission on Environmental Pollution provides no justification for its statement that

every human is entitled to release into the atmosphere the same quantity of greenhouse gases (RCEP 2000: 2).

² Note that, under Contraction and Convergence, children are included in the calculation to determine the allocation of emissions rights between nations but are not allocated rights or revenue under the national emissions trading or tax schemes described above. The issue of whether commons arguments conclude that children should be entitled to rights or revenue is discussed in Section 5.4.

Where arguments for EPCA are offered, they are, as mentioned, most often based on the notion that the atmosphere or sinks are a commons. Examples of such arguments are set out in Section 2.2 but, to enable a fuller understanding of these arguments, I first discuss the atmosphere's role as a holding bay for greenhouse gases and what exactly is meant by the term *sink*.

2.1. *The atmospheric holding bay and emissions sinks*

2.1.1. *The atmospheric holding bay*

The three main greenhouse gases arising from human activity are carbon dioxide, methane and nitrous oxide. In 2000, and in terms of their contribution to warming, these gases constituted, respectively, 77%, 14% and 8% of emissions (WRI 2005: 4-5). Having been released into the atmosphere, carbon dioxide remains there for 5-200 years before being removed by sinks, methane for an average of 12 years and nitrous oxide for an average of 114 years (Houghton et al. 2001: 38). Hence, the atmosphere can be said to act as a holding bay for these greenhouse gases prior to their removal.

2.1.2. *Carbon dioxide sinks*

The Intergovernmental Panel on Climate Change (IPCC) defines a sink as

Any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas or aerosol from the atmosphere (Houghton et al. 2001: 796).

The two main processes that remove carbon dioxide (CO₂) from the atmosphere are photosynthesis by land-based plants and the dissolution of the gas into the oceans. (Let's call this the *gross removal* of CO₂ from the atmosphere). Over the several thousand years prior to the industrial revolution, almost exactly the same quantity of CO₂ as was removed from the atmosphere was returned – from the land mainly through respiration by plants and animals, and from the oceans, by outgassing. Thus, the *net removal* of CO₂ from the atmosphere was approximately zero.³

Since the industrial revolution, human activity, mainly the combustion of fossil fuels and deforestation, has released increasing quantities of CO₂ into the atmosphere.⁴ But since the industrial revolution, human activity has also resulted in the land and oceans becoming *net removers* of CO₂ from the atmosphere. With regard to land, although flows of CO₂ to the atmosphere have increased as the result of emissions from deforestation, these have been more than offset by flows in the opposite direction resulting from

changes in land management practices and fertilisation effects of increased atmospheric CO₂ and nitrogen (N) deposition, leading to increased vegetation and soil carbon (Houghton et al. 2001: 185).⁵

And with regard to oceans, the increase in emissions of CO₂ since the industrial revolution has increased the atmosphere-ocean difference in partial pressure of carbon dioxide ($p\text{CO}_2$) which

³ Prior to the industrial era, the concentration of CO₂ in the atmosphere was 280±10 parts per million by volume (ppmv) for several thousand years. Within the natural carbon cycle, the land system removes from and releases into the atmosphere around 120 gigatonnes of carbon (GtC) per annum. The figure for the oceans is around 90 GtC per annum (Houghton et al. 2001: 188).

⁴ In 2004, annual global emissions of CO₂ from human activity were equivalent to 8GtC (WRI 2008).

⁵ During the 1980s, 1990s and 2000-2005, the net annual flow of CO₂ from the atmosphere to land is estimated to have been, respectively, 0.3, 1.0 and 0.9 GtC (Solomon et al. 2007: 26).

has resulted in the oceans removing more CO₂ from the atmosphere than they release.⁶ However, although the land and oceans have become *net removers*, as they remove only a fraction of the CO₂ released into the atmosphere through human activity,⁷ the atmospheric concentration of CO₂ continues to rise.⁸

In relation to CO₂, the term *sink* is not always used within the IPCC's reports in accordance with its definition. For whilst the IPCC defines a sink in terms of (1) gross removal, on occasion the term is used, as the following passage illustrates, to refer to (2) the net removal of CO₂.

The difference between the net terrestrial flux and estimated land-use change emissions implies a residual land-atmosphere flux of -82 PgC (i.e. a terrestrial sink) over the same period (Houghton et al. 2001: 193).

And on occasion the term is used, as the following passage illustrates, to refer to (3) the system responsible for this net removal.

The terrestrial system is currently acting as a global sink for carbon...despite large releases of carbon due to deforestation in some regions (Houghton et al. 2001: 193).

The American Meteorological Society (AMS) defines a "carbon sink" as "A reservoir that receives carbon from another carbon reservoir" (AMS 2000). Although similar to the IPCC definition, it is not identical, for whilst the IPCC definition refers to the processes responsible for the gross removal from the atmosphere, the AMS definition refers to the system that is the recipient of the gases removed. However, the AMS notes that the a carbon sink is

Commonly used to denote a reservoir where the carbon amount increases because its total carbon received from all other reservoirs exceeds its total carbon transfer to the other reservoirs.

This use of the term equates to use (3) within the IPCC's reports.

2.1.3. *Sinks for methane and nitrous oxide*

Methane released into the atmosphere is destroyed as a result of reacting with hydroxyl radicals in the troposphere, and nitrous oxide released into the atmosphere is destroyed by photodissociation and its reaction with electronically excited oxygen atoms in the stratosphere (Houghton et al. 2001: ch4). As a result of human activity, the quantity of these two gases released to atmosphere has increased and as the methane and nitrous oxide sinks have not been able to destroy the gases as fast as they have entered the atmosphere, atmospheric concentrations have risen.

2.2. *Two commons arguments*

2.2.1. *The atmosphere as commons*

Discussing the allocation of emissions rights between nations, Baer (2002: 401) gives a clear statement of the atmosphere-as-commons argument for EPCA.

⁶ During the 1980s, 1990s and 2000-2005, the net annual flow of CO₂ from the atmosphere to the oceans is estimated to have been, respectively, 1.8, 2.2 and 2.2 GtC (Solomon et al. 2007: 26).

⁷ The "airborne fraction", defined as the percentage of annual CO₂ released through human activity that remains in the atmosphere, has been around 60% for the last five decades (Alexandrov et al. 2007).

⁸ At the beginning of the industrial revolution, the atmospheric concentration of CO₂ was about 280 ppmv. In 2005 it was 379ppmv (Solomon et al. 2007: 25).

The central argument for equal per capita rights is that the atmosphere is a global commons, whose use and preservation are essential to human well being.⁹

Likewise, when discussing the allocation of emissions rights between nations, Meyer, the originator of Contraction and Convergence, argues for

equal rights to the use of the limited amount of the resources of the global commons that is consistent with sustainability (Meyer 2000: 17).

In discussing the allocation of revenue within a nation, Barnes puts forward a similar argument and makes numerous references to the atmosphere's role as a holding bay, or, as he refers to it, the "carbon storage capacity" of the sky (Barnes 2001: 21, 29, 41, 46). In Barnes' view, "The sky is nothing if not the ultimate commons" and it is the "equal and universal ownership" of this holding bay that gives all the right to emit equally into it. And, thus, auction revenue should be allocated "to all according to their equal ownership" (respectively, Barnes 2001: 54, 72, 72).

2.2.2. Emissions sinks as commons Whilst most argue for EPCA on the basis that it is the atmosphere that is a commons, some argue for the allocation on the basis that it is sinks for greenhouse gases that are a commons. For example, Agarwal and Narain (1991: 13) write that

sustainable development demands that human beings collectively do not produce more carbon dioxide and methane than the earth's environment can absorb. The question is how should this global common – the global carbon dioxide and methane sinks – be shared amongst the people of the world.

Several studies on the global warming problem have argued, and we argue ourselves, that in a world that aspires to such lofty ideals like global justice, equity and sustainability, this vital global common should be shared equally on a per capita basis.

Although Agarwal and Narain make mention only of sinks for CO₂ and methane, I take it that they have in mind that the commons consists of sinks for *all* greenhouse gases. And note that their use of the term *sink* appears to be closest to the IPCC's usage (1) described above.

Following these examples of commons arguments for EPCA, I proceed in Section 4 to explore more fully the notion of a commons, as three differing uses of the term appear within the literature (Narveson 1999: 212). However, in order to frame this exploration, Section 3 briefly discusses the concept of ownership.

3. Ownership

A useful starting point for exploring issues of ownership relevant to this paper is the following passage from John Locke's *Second Treatise on Civil Government* (Locke [1689] 1986: 19-20).

God, who hath given the world to men in common, hath also given them reason to make use of it to the best advantage of life and convenience...Though the earth and all inferior creatures be common to all men, yet every man has a "property" in his own "person". This nobody has any right to but himself. The "labour" of his body and the "work" of his hands, we may say, are properly his. Whatsoever then he removes out of the state that nature hath provided and left it in, he hath mixed his labour with it, and joined to it something that is his own,

⁹ Note, however, that Baer no longer advocates EPCA (Baer et al. 2007).

and thereby makes it his property. It being removed from the common state Nature placed it in, it hath by this labour something annexed to it that excludes the common right of other men. For this “labour” being the unquestionable property of the labourer, no man can have a right to what that is joined to, at least where there is enough, and as good left in common for others.

Locke here sets out his views on ownership of self, the original ownership status of the world and on how parts of the world can be taken into private ownership, and these are discussed below. Note that contemporary libertarian thought, which draws extensively upon the work of Locke, pays particular attention to these issues and, in Section 5.3, libertarians’ arguments are contrasted with those of their opponents.

3.1. Self-ownership and original world ownership

Locke held that everyone has property in their person i.e. that everyone is a self-owner. Self-ownership is also endorsed by contemporary libertarians and is usefully summarized by Mack (2002a: 76) as

the thesis that each individual possesses original moral rights over her own body, faculties, talents and energies. Adherents of this thesis believe that it best captures our common perception of the moral inviolability of persons – an inviolability that is manifested in the wrongfulness of unprovoked acts of killing, maiming, imprisoning, enslaving, and extracting labor from others. They believe that the rights of self-ownership provide individuals with the moral immunities appropriate to beings whose lives and well-being are of separate and irreplaceable moral importance.

Locke also held that as a result of God in the beginning gifting the world to humankind, the world was originally commonly owned. And as Wenar (1998: 804) explains, under common ownership “everyone initially owns everything”. In marked contrast to Locke, contemporary libertarians reject the notion that in the beginning the world was owned in common and hold instead that everyone initially owned nothing. As Narveson (1999: 213) trenchantly argues

In the first place, no one can have any reason for thinking that the creator, if there is one, would necessarily “give” nature to mankind in general, rather than to some favoured group – the “Chosen people,” say – or even to no one. In any case, we must reject theology for these purposes. Theology is not publicly provable from common sense and science; to use it at all discriminates against those with different religious views, or none...

Once we understand that the world was not made by anybody, for anyone or any purpose in particular, then we must confront the fact that the world is just stuff, devoid of moral qualities and not [initially] owned by anyone let alone everyone.

Or as Otsuka (2003: 22 n28) puts it

In the absence of any such belief that the earth was previously owned by some being who transferred this right of ownership to humankind at the outset, it is reasonable to regard the earth as initially unowned.

However, as we shall see in Section 5.3, not all contemporary philosophers endorse self-ownership or subscribe to the view that the world was originally unowned.

3.2. *Private ownership of nature*

From the above, it can be seen that, whilst Locke required a theory of how to take into private ownership a world that was originally under common ownership, modern philosophers such as Narveson and Otsuka require a theory of how to take into private ownership a world in which there was originally no ownership. Discussing terminology, Risse (2004: 344) notes that

the no ownership scenario requires a theory of *acquisition*, the crucial issue being how to create rights and duties constitutive of property in the first place. The common ownership scenario requires a theory of *privatization*, the crucial issue being how to derive rights and duties constituting private ownership from an already existing bundle constituting common ownership...I will speak of ‘appropriation’ when staying neutral between acquisition and privatization.

In the remainder of the paper, my use of terminology follows that of Risse.

Contemporary libertarian accounts of justice place considerable emphasis on the role of initial acquisition and, like Locke, contemporary libertarians hold that, subject to so-called Lockean Proviso that one should leave “enough, and as good” for others, one can take into private ownership

those elements of the environment over which one has exerted and continues intentionally to exert control (Narveson 1999: 215).

However, whilst Locke held that one exerts intentional control through the process of labour mixing, contemporary libertarians do not necessarily share this view with proposed alternatives including “incorporation” and “first occupation” (Wenar 1998: 802).¹⁰

Note that libertarians interpret the Lockean Proviso in radically different ways. So-called *right-libertarians* interpret it in ways that allow significant inequalities of wealth to develop (Narveson 1999, Mack 2002a, 2002b), whereas so called *left-libertarians* interpret it in ways that result in much more equal distributions of wealth (Vallety 2006).

4. The commons revisited

As noted in Section 2.2.2, the term *commons* is used in three differing ways within the literature. Two of the uses describe pre-appropriative states. For instance, when Locke uses the term, he is referring to those parts of the originally *commonly-owned* world that have not been privatized and, thus, remain commonly owned. (Let’s call a commons in this sense, C1). However, when many contemporary philosophers use the term, they are referring to those parts of the originally *unowned* world that have not been acquired and, thus, remain unowned (see, for example, Schmidtz 1997, Mack 2002a). (Let’s call a commons in this sense, C2). By contrast, the third use of the term refers to a post-appropriative state, for when people talk of, for example, the Swiss Commons, they are referring to a form of jointly owned private property. It is the first two uses of the term that are relevant to this paper.

Atmosphere-as-commons and sinks-as-commons arguments for EPCA such as those outlined in Section 2.2 are explored below. Some of these arguments use, or appear to use the term *commons* in the C1 sense whilst others appear to use it in the C2 sense. I say “appear to use” as writers are not always explicit about the sense in which they are using the term. Thus, to make as clear as

¹⁰ See also Schmidtz (1997: 32 n3).

possible what I take these arguments to be and to enable them to be discussed in detail, I set them out formally, explicitly stating their premises and conclusions.

Sections 5 and 6 explore argument for EPCA based on the view that the atmosphere is, respectively, C1 and C2 whilst Section 7 and 8 explore arguments based on the view that the sinks are C2.

5. From the atmosphere as C1 to EPCA

This section explores Barnes' argument, outlined in Section 2.2.1, that EPCA follows from the fact that the atmosphere is C1. Sections 5.1 and 5.2 explore his argument as to why, today, the atmosphere is C1 whilst an alternative argument is explored in 5.3. Section 5.4 explores Barnes' move from C1 to EPCA.

5.1. Barnes' argument for the atmosphere as C1

As noted in Section 3.1, under common ownership everyone initially owns everything. Thus, everyone is initially a joint and equal owner of everything, including the atmosphere. Starting from this point, Barnes argues that the atmosphere is not something that can be privatized and thus, to this day, remains jointly and equally owned (C1). His argument can be stated formally as follows (P = premise, C = conclusion).

Argument 1

P1: In the beginning, the atmosphere was commonly owned (C1)

P2: The atmosphere is not something that can be privatized

C: Today the atmosphere remains commonly owned i.e. jointly and equally owned by all

Before discussing Argument 1, it should be noted that although at times Barnes argues that the atmosphere is C1, at others he seems to suggest that it might be C2. For example, he writes

One day it hit me: The carbon storage capacity of the sky is a very valuable asset. But whose asset is it? I didn't see anyone around who owned it – who, as an owner, could limit usage and charge prices. Maybe we needed to find an owner, I thought. But who might this be (Barnes 2001: 82)?

Perhaps Barnes is simply ambivalent over the ownership status of the atmosphere, or perhaps he is arguing that whilst *morally* the atmosphere is equally owned by all, a *legal* arrangement that he regards as reflecting this moral ownership, namely an EPCA of (rights or) revenue, should be put in place. But whatever his view, it is informative to analyze his Argument 1.

To justify Premise 1, Barnes (2001: 53) invokes theology to make a Lockean argument.

The sky is a gift from our common creator. It wasn't given to a government, and certainly not to private corporations. We, the meek, are its inheritors.

However, as noted in Section 3.1.2, many contemporary philosophers do not accept theological justifications. Whether, instead, there are non-theological justifications for Premise 1 is explored in Section 5.3, following a discussion of Barnes' Premise 2, which he seeks to justify by citing Roman law (Barnes 2001: 46-7). For Roman law, he claims, held that the atmosphere was not an entity susceptible to privatization.

5.2. The atmosphere and Roman law

Roman law divided things (*res*) into various categories. Land was taken to be originally unowned (*res nullius*) and, through the process of acquisition, could become privately owned (*res privatae*),

state owned (*res publicae*) or owned by a corporate body (*res universitatis*). However, in contrast to land, certain things were not regarded as susceptible to private ownership and were held to be commonly owned (*res communes*). As Rose (2003: 93) puts it

Res communes encapsulates what might be called the Impossibility Argument against private property: The character of some resources makes them incapable of “capture” or any other act of exclusive appropriation.

And a famous passage (Section II.1.1) from the Justinian Institutes (a work on Roman law commissioned by the Emperor Justinian) states that the atmosphere is one of those things that are *res communes*.

By the law of nature these things are common to mankind – *the air*, running water, the sea, and consequently the shores of the sea (Cooper 1968: 70, emphasis added).

However, Roman law distinguished between two aspects of the air: (1) *airspace*, the space above the earth’s surface and (2) the *air molecules* which move around within airspace. According to Cooper (1968: 69, 71)

The distinction between “air” and “airspace” was as clear in Roman law as it is today. The legal status of the air (or atmosphere) which men breathed was not the same as that of the space through which the air circulated...The Roman jurists of the classical period, as well as the compilers of the Justinian Digest and Institutes, usually distinguished between the words “aer,” as the atmosphere we breathe, and “coelum,” as the area (sky or airspace) in which the air circulates.

As noted in Section 2.2.1, Barnes’ discussion of the atmosphere emphasizes its greenhouse gas storage capacity. And as it is airspace in which greenhouse gases are stored, I take Barnes to be arguing that it is *airspace* that is unsusceptible to private ownership and, thus, *res communes*. Hence, Argument 1 can be refined as follows.

Argument 1.1

P1: In the beginning, *airspace* was commonly owned (C1)

P2: *Airspace* is not something that can be privatized

C: Today *airspace* remains commonly owned i.e. jointly and equally owned by all

However, the Justinian Institutes do not, in fact, support the second premise of Argument 1.1. For as Cooper (1968: 71) notes, when the Justinian Institutes state that the air is “common to mankind” it is not airspace but *air molecules* to which they are referring.

“Coeleum” (airspace) was subject to private and exclusive rights. “Aer” (air) was common to all men. There was no confusion. One represented an area and the other the element used for breathing.

However, although Roman law regarded airspace as subject to private and exclusive rights, it did not regard *all* of airspace to be subject to such rights.

5.2.1. How much airspace can be privately owned?

According to Cooper (1968: 57)

Land and *usable* space...necessarily constitute a *single social unit*. Usable space is not an appurtenance to the land below but with such land forms the basic integrated sphere of human activity...(emphasis added)

Land and usable airspace together constitute a single social unit precisely because ownership of airspace above an owned piece of land is necessary for the owner to make use of and enjoy their land. Justice William Douglas made this point in the US Supreme Court in 1946, noting that a landowner must have

exclusive control of the immediate reaches of the enveloping atmosphere [since otherwise] buildings could not be erected, trees could not be planted and even fences could not be run (Gray and Gray 2006: 7).

But if ownership of the airspace above an owned piece of land is necessary, up to what height should it extend? The English common law maxim of *cuius est solum eius est usque ad coelum* (literally *for whomsoever owns the soil, it is theirs up to the sky*) which developed in the sixteenth century held that an owner of a piece of land owned the airspace above that land out to the edge of the atmosphere and beyond. However, whilst the maxim developed out of Roman law, Roman law itself did not take this view, holding, as Cooper notes, only that *usable* airspace was owned. Commenting on the maxim, Cooper (1968: 85) observes that

Roman law was never guilty of extravagant statements of private property rights...Roman law protected the needed rights of the landowner to the use and enjoyment of space above his lands...implying, though not stating, that these space rights constituted “dominium” (ownership) but without fixing definitely the height in space to which these rights extended.

But nowhere in the original Roman texts has been found any statement that the owner of the surface also owned the space above “up to the skies” or “to infinity” (as the maxim is capable of being translated and interpreted). It is at this point that the maxim may be charged with having a non-Roman origin.

A similar approach is taken in modern English law. In 1974, Lord Wilberforce dismissed the *cuius est solum* maxim as

so sweeping, unscientific and unpractical a doctrine [that it] is unlikely to appeal to the common law (Thompson 2006: 10).

And in 1978, Justice Griffiths noted that the maxim would lead to the absurdity that an action of trespass could be brought each time a satellite passed over a suburban garden (Thompson 2006: 11). Gray and Gray (2006: 7-8) neatly summarize the position of English law thus.

The definition of ‘land’ must also comprise some sector of the airspace above ground level, since the surface owner would otherwise constitute a trespasser in that airspace as soon as he sets foot on his land...The common law thus draws a pragmatic distinction between two different strata of airspace.

The lower stratum The lower stratum of airspace comprises that portion of the immediately superjacent airspace whose effective control is necessary for the landowner’s reasonable enjoyment of his land at ground level. This stratum is unlikely in most cases to extend beyond an altitude of much more than 150 or

200 metres above roof level, this being roughly the minimum permissible distance for normal overflight by any aircraft...

The higher stratum It is clear that the maxim *cuius est solum*...has no relevance at all to the higher stratum of airspace which lies beyond any reasonable possibility of purposeful use by the landowner below.

Let's call the height up to which ownership of airspace is necessary to ensure enjoyment of land, Height H. Given that airspace can be privately owned up to Height H, then clearly Premise 2 in Barnes' Argument 1.1 does not hold. However, given that Height H is only a few hundred metres or so above roof level and that the vast majority of airspace therefore lies above Height H, Barnes could adjust Premise 2 and, thus, modify Argument 1.1 as follows.

*Argument 1.1**

P1: In the beginning, airspace was commonly owned (C1)

P2: Airspace above Height H is not something that can be privatized

C: Today airspace above Height H (i.e. the vast majority of airspace) remains commonly owned i.e. jointly and equally owned by all

And from here he could argue that EPCA follows from the fact that airspace is, to all intents and purposes equally owned (see Section 5.4). However, as noted in Section 3.1.2, contemporary libertarian philosophers take the view that all of airspace was originally unowned. Thus, for them, both Arguments 1.1 and 1.1* fail as Premise 1 doesn't hold. And, thus, I now consider the libertarian view that the world was originally unowned and philosophical challenges to it.

5.3. Contemporary philosophical debates around original ownership

Nozick (1974) takes the view that the world was originally unowned. However, Cohen (1995: 94) responds that Nozick's view is nothing more than a "blithe assumption". Mack (2002b: 240) replies that

Despite Cohen's description of Nozick's belief as a "blithe assumption"...surely the default position about "raw worldly resources"...is simply that they are unowned. In the absence of credible positive arguments for some form of original proprietorship over nature, the assumption that raw worldly resources are originally unowned is not blithe at all.

Note that Mack does not claim that his position that the world was originally unowned is the conclusion of an *argument* but instead characterizes it merely as an *assumption*.¹¹ However, for Mack, rather than this assumption being casual or careless (the relevant sense of Cohen's "blithe") it is instead significantly persuasive in that it requires a "credible positive argument" to overturn it. But if Mack is basing his position on an assumption, I presume he must hold that, though it is intuitively deeply plausible, it is not possible to provide an argument in support of it.¹²

¹¹ This also appears to be the position of Narveson and Otsuka - see Section 3.1.

¹² As Schmidt (1996: 84) remarks, "...any chain of justification must come to an end, and no chain has enough links to satisfy everyone...". It is, I suppose, possible that Mack holds that, because the assumption is so intuitively deeply plausible, producing an argument in support of it, whilst possible, is not necessary. However, given the philosophical disagreement over original world ownership, I assume that if an argument in its support were possible, it would have been made.

Wenar (1998: 804) offers the following thoughts with regard to Mack's assumption.

Modern theorists...might think that the universal-ownership construals of the starting state cannot be motivated without an appeal to quaint theological premises. Or at least the burden should be on the proponent of universal-ownership to say why it should be thought that everyone initially owns everything, rather than that everyone initially owns nothing.

Yet is it so obvious that this second assumption needs less justification than the first? None of the possible states of nature is, after all a rights-vacuum. In the no-ownership scenarios each person has the natural right to create property rights in herself – is this less contentious than that each person should be vested with property rights from the start? Moreover, the no-ownership variants give each inhabitant of the state of nature the right of using (even using up) what others may want or need, while the common-ownership states give each equal say in determining the disposition of the resources that all might use. When phrased in these terms – in terms of “equal freedom” versus “equal voice” – it seems less likely that no-ownership can win by default.

Libertarians would respond to Wenar by saying that, yes, (for them) original self-ownership *is* (far) less contentious than original common ownership of the world. To explain why, we should note that in the passage above Wenar adopts a *natural rights* perspective, which elsewhere he summarizes as follows.

All natural rights theories fix upon features that humans have by their nature, and which make respect for certain rights appropriate. The theories differ over precisely which attributes of humans give rise to rights, although non-religious theories tend to fix upon the same sorts of attributes described in more or less metaphysical or moralized terms: rationality, free will, autonomy, the ability to regulate one's life in accordance with one's chosen conception of the good life (Wenar 2007).

Given this natural rights perspective, libertarians would argue that the central importance of, for example, individual autonomy and of being able to “regulate one's life in accordance with one's chosen conception of the good life” means that the right of self-ownership, with the protection from undue interference that it affords, is exactly the sort of natural right that individuals should have. And indeed Mack (1997: 13) makes reference to

the plethora of arguments that attempt to proceed from considerations of the importance or value of rational agency or of individual autonomy or of human dignity, or from the separateness of persons and their projects and commitments to the conclusion that each rational agent, autonomous individual, separate value-creator, or value pursuer possesses a right to self-ownership or some comparable fundamental right to liberty (in the disposition of her person).

Libertarians would continue that whilst (for them) a natural right to self-ownership is not contentious, given the intuitively deeply plausible assumption that the world was originally unowned, the proposition that “each person should be vested with property rights from the start” certainly is. Now Wenar could, of course, rightly point out that, whilst self-ownership might not be contentious for libertarians, it most certainly is for others (see, for example, Cohen 1995). However, for the purposes of this discussion, the question is whether Wenar produces credible positive arguments to overturn libertarians' deeply plausible assumption.

Simply put, Wenar’s position appears to be that an egalitarian distribution of resources is a desirable end and that original world ownership and the “equal voice” it gives can bring it about. Right-libertarians would respond that they do not accept Wenar’s egalitarian outlook, instead holding that significant inequalities in wealth can be perfectly legitimate. And left-libertarians, whilst sharing Wenar’s egalitarian sentiments would offer two responses. First, they would question whether, in practice, common ownership leads to “equal voice”. If everything is owned by everyone, then, *in theory*, if one person wishes to privatize a particular bit of the world, the consent of her co-owners is required. But whilst, in theory, everyone may have an equal voice, Vallentyne (2006) argues that, in *practice*, logistical considerations will make obtaining the consent of all “impossible, extremely difficult, or expensive”.¹³ Second, left-libertarians would point out that original ownership is not necessary to bring about an egalitarian distribution: an originally unowned world combined with an appropriate formulation of the Lockean Proviso (Section 3.2) will do the job.

In response to this last point, Risse, who himself defends a particular version of original common ownership (Risse 2009a), argues that the left-libertarian combination of self-ownership and an originally unowned world is incoherent (Risse 2004). However, Vallentyne et al (2005) refute the charge of incoherence. Thus, as will most issues in philosophy, the question of the original ownership status of the world remains contested. But it is worth noting that the majority of philosophers writing in this area appear to hold that the world was originally unowned. And furthermore, Risse (2009b) is clear that the version of common world ownership he defends does not imply that humanity has common ownership of the atmosphere. Thus, we can conclude that there is limited contemporary philosophical support for Premise 1 in Barnes’ Argument 1.1.

5.4. From C1 to EPCA

Thus far we have discussed a number of objections to Barnes’ Argument 1.1 for airspace being C1. However, if for the sake of argument, we assume it to be so, then how does Barnes get from airspace as C1 to EPCA for adults within a nation? As noted in Section 2.2.1, Barnes (2001: 72) view on allocating (rights or) revenue is “to all according to their equal ownership” and this appears to be a condensation of the following two arguments.

Argument 2

- P1: If airspace is equally owned by all, then all have the right to release an equal share of permitted emissions into it (henceforth “to emit equally”)
- P2: Today airspace is equally owned by all
- C: Today all have the right to emit equally

The conclusion of this first argument forms the second premise of the second.

Argument 3

- P1: If all have the right to emit equally, then all should be allocated an equal amount of (rights or) revenue
- P2: Today all have right to emit equally
- C: Today all should be allocated an equal amount of (rights or) revenue.

However, note that *all* means children as well as adults and, whilst Barnes argues “to *all* according to their equal ownership”, what he, in fact, advocates is that (rights or) revenue be shared equally between *adults only*. To justify EPCA to adults only, Barnes would have to reject Premise 1 in Argument 2 and argue as follows.

¹³ A similar point is made by Locke ([1689] 1986: 20) who notes that “If such a consent as that was necessary, man had starved, notwithstanding the plenty God had given him”.

*Argument 2**

- P1: If airspace is equally owned by all, then *only adults* have the right to emit and *all adults* have the right to emit equally
P2: Today airspace is equally owned by all
C: Today only adults have the right to emit and all adults have the right to emit equally

*Argument 3**

- P1 If all adults have the right to emit equally, then all adults should be allocated an equal amount of (rights or) revenue
P2: Today all adults have right to emit equally
C: Today all adults should be allocated an equal amount of (rights or) revenue.

Clearly it is important to explain why, if children are equal owners of the atmosphere, they are not entitled to (rights or) revenue. However, Barnes offers no justification for Premise 1 in Argument 2* and it is not obvious what a justification might be (Starkey 2009).

6. From the atmosphere as C2 to ECPA

Whilst Barnes' argument for EPCA is based on his holding airspace to be C1, this section examines an argument for EPCA made by a Müller which is based on his holding airspace to be C2. Müller (1999: 7-8) writes

It is not difficult to see what would be involved in giving a moral justification for the per capita proposal. All we need to do is to treat our quota distribution problem as something akin to the process of establishing individual property rights for a common good, namely the atmosphere as repository of anthropogenic emissions. Assuming that individual people – as opposed to, say, nation states – are taken to be the rightful claimants, the per capita proposal will be justified by arguing on egalitarian grounds that everyone has an equal claim on this common good.

Müller's talk of "establishing" individual property rights in the "common good" that is the atmosphere suggests that he takes the view that property rights in the atmosphere have yet to be established and that the atmosphere is therefore unowned i.e. C2. And given Müller's focus on the atmosphere as a "repository" for emissions – that is, on airspace – I take Müller to be making the following argument.

Argument 4

- P1: In the beginning, airspace was unowned (C2)
P2: Since the beginning, airspace has not been acquired
C: Today airspace remains unowned

However, given the general agreement that airspace above owned land is owned up to Height H, it must be that only (1) airspace above Height H and (2) those parts of the airspace below Height H that are above unowned land are unowned. If (1) and (2) are together referred to as *airspace**, then Müller's Argument 4 would have to be modified as follows.

*Argument 4**

- P1: In the beginning, airspace was unowned (C2)
- P2: Since the beginning, airspace* has not been acquired
- C: Today airspace* remains unowned (C2)

As airspace consists very largely of airspace*, then according to this argument, airspace is very largely unowned. However, as a right of all to emit equally does *not* follow from the fact that airspace is largely unowned, then Müller cannot (and does not) make the following argument.

Argument 5

- P1: If airspace is largely unowned, then all have the right to emit equally
- P2: The atmosphere is largely unowned
- C: Today all have the right to emit equally

Instead, Müller's argument for the right of all to emit equally follows from them having an "equal claim" to airspace based on "egalitarian grounds" (henceforth referred to as "other egalitarian grounds" to emphasize that the grounds are those other than the equal ownership of airspace). Thus, Müller argues for EPCA by making Argument 6 followed by Argument 3.

Argument 6

- P1: If all have an equal claim to airspace, then all have a right to emit equally
- P2: Today, on other egalitarian grounds, all have an equal claim to airspace
- C: Today all have a right to emit equally

Müller does not suggest what these other egalitarian grounds might be and, in Section 8, I briefly discuss whether there are any such grounds that garner philosophical support.¹⁴ However, here I conclude Section 6 by examining a further facet of Müller's argument.

6.1. Individual property rights in airspace?

For Müller, (1) allocating emissions rights is akin to (2) "establishing individual property rights" in airspace. And given that, for Müller, an equal claim to the atmosphere leads to (1) an equal per capita allocation of emissions rights, he would appear to be (coming close to) suggesting that so too does it lead to (2) individuals being entitled to establish equal property rights in airspace. This section suggests that the notion of establishing equal individual property rights in airspace is considerably more problematic than allocating emissions rights to individuals.

In a world with n individuals, then each is entitled to establish property rights in either a particular n th of airspace or to all of airspace. Given that individuals own differing amounts of land and, thus, differing amounts of airspace below Height H , the first option presumably requires each individual to acquire a share of airspace* that, when added to the airspace that they own below Height H , gives them an n th share of total airspace. This option is problematic on two counts. First, it has to be asked what the act of acquiring airspace would consist of and how a particular chunk acquired would be demarcated? The nature of the acquisitive act is hard to

¹⁴ Given that the 1919 *Paris Convention for the Regulation of Aerial Navigation* recognized the full sovereignty of states over the airspace above their land and territorial sea (Shaw 2003), it might alternatively be argued that airspace* is not unowned (i.e. C2) but has, instead, been taken into ownership by the state. Of course, some libertarians do not regard the state as a legitimate institution (Mack and Gaus 2004), but even assuming it to be so, it is not clear what difference there would be under a state-ownership and a no-ownership regime with regard to the allocation of rights or revenue. If there were other egalitarian grounds for EPCA, then, presumably, under a no-ownership regime, the state, as the institution tasked with allocating rights or revenue, would be obliged to implement EPCA on those grounds. But, presumably, under the state-ownership regime, the state would likewise be obliged to base its allocation on these other egalitarian grounds and implement EPCA.

imagine (at least for this author). Second, and more importantly, it is difficult to see the merit in each individual owning an nth of airspace when they would be unable to store their emissions there. After all, air molecules move around throughout airspace and so every individual's emitted molecules would be trespassing into others' airspace.

The second option of establishing property rights in all of airspace doesn't fare much better in that it is again hard to imagine (at least for this author) what an act of n individuals jointly acquiring all of airspace would consist in. And even assuming that such acquisition occurred, then, in theory at least, each joint owner would require the agreement of their n-1 co-owners in order to emit into it (Wenar's "equal voice" point in Section 5.3).

7. From sinks as C1 or C2 to EPCA

We now move from atmosphere-as-commons arguments for EPCA to sinks-as-commons arguments. As noted, contemporary libertarian philosophers reject the notion of original common ownership and just as this would lead them to reject the notion that the atmosphere is today C1, so it would lead them to reject the notion that sinks are such. However, the position of Agarwal and Narain, quoted in Section 2.2.2, is less clear.

Agarwal and Narain state elsewhere in their paper that they regard sinks as part of the "common heritage of humankind" (1991: 7). This is a gender-neutral version of the term "common heritage of mankind" which entered the domain of international law in 1967. In 1970, a UN General Assembly Declaration declared the sea-bed and the ocean floor to be a common heritage of mankind, a declaration that paved the way for the deep sea-bed and the ocean floor beyond the limits of national jurisdiction to be declared a common heritage of mankind under the *Law of the Sea Convention* concluded in 1982. And in 1979, the *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies* declared the moon and its resources to be a common heritage of mankind (Baslar 1998). Baslar notes that various attempts have been made to have other resources including the atmosphere (though not sinks) declared a common heritage of mankind, but goes on to report that in 1988, the UN General Assembly

refrained from using the common *heritage* of mankind language in the case of the atmosphere when they adopted a resolution declaring that "climate change is a common *concern* of mankind" (Baslar 1998: 116, emphasis added).

However, even had the atmosphere, or, for that matter, sinks been declared a common heritage of mankind this would not necessarily have clarified matters. For example, Vyver (1992: 485) takes the view that the common heritage of mankind is "a contemporary version of the Roman Law concept of *res...communes*" whereas Baslar (1998: 39) instead argues that a "non-property" interpretation of the concept is appropriate. Thus, Agarwal and Narain's use of common heritage language does not in itself clarify whether they view sinks as C1 or C2. In the passage quoted in Section 2.2.2, the authors note that

The question is how should this global common – the global carbon and methane sinks – be shared amongst the people of the world?

However, neither does this passage entirely clarify matters. The fact that the authors ask how sinks *should* be shared out might suggest that they regard them as not yet shared out and hence as C2. However, they may alternatively hold that sinks are *morally* commonly owned i.e. C1 and that *legal* arrangements should be put in place to reflect this. But whilst Agarwal and Narain's position is unclear, Grubb (1995: 483) appears to regard sinks as C2.

The allocation of emissions rights addresses the fundamental question: having discovered that the global commons – in this case, the assimilative capacity of the atmosphere – is a limited and hitherto unclaimed resource, how should it be divided...?

Though, strictly speaking, the phrase “assimilative capacity of the atmosphere” refers only to the sinks for methane and nitrous oxide (see Section 2.1.3), I take Grubb as holding that the global commons consists of the sinks for *all* greenhouse gases. And his use of the term “unclaimed” suggests that he holds that these sinks are unowned i.e. C2. Thus, Grubb’s implicit argument appears to go as follows.

Argument 7

- P1: In the beginning, sinks were unowned
- P2: Since the beginning, sinks have not been acquired
- C: Today sinks remain unowned i.e. are C2

However, as the right of all to emit equally does not follow from the fact that sinks are unowned, it must follow from an equal claim to sinks based on other egalitarian grounds (i.e. grounds other than the equal ownership of sinks). Thus, I take it that a move from C2 to EPCA requires Argument 8 below followed by Argument 3.

Argument 8

- P1: If all have an equal claim to sinks (i.e. to the processes that remove greenhouse gases from airspace), then all have a right to emit equally into airspace
- P2: Today, on other egalitarian grounds, all have an “equal claim” to sinks
- C: Today all have a right to emit equally into airspace

Given that Arguments 6 and 8 for EPCA depend upon their being other egalitarian ground for an equal claim to airspace or sinks, Section 8 briefly considers whether contemporary philosophers hold such grounds to exist.

8. Other egalitarian grounds for EPCA?

The holding bay properties of airspace and the sink processes that remove greenhouse gases from airspace are part of what we might call nature’s greenhouse gas removal system. In Starkey (2008), I discuss a series of two arguments for EPCA within nations (Arguments 9 and 10 below).¹⁵ Argument 9 is an argument for an equal claim to use this greenhouse gas removal system which is based on an egalitarian ground other than the equal ownership of airspace, namely that adults are entitled to an equal quantity of energy. Note that an *emissions factor*, referred to in premise 2, is the quantity of emissions resulting from the use of a unit of energy.

Argument 9

- P1: In a just society, all adults would be entitled to an equal quantity of energy
- P2: Each adult’s energy use has the same emissions factor
- C: In a just society, all adults would be entitled to release an equal quantity of emissions

The conclusion of Argument 9 forms the second premise of Argument 10.

¹⁵ The discussion here is limited to the allocation of rights or revenue *within* a nation as the question of the role that historical emissions play in the allocation of rights *between* nations adds an additional layer of complexity. For example, even if it were argued that EPCA should be implemented within nations, it might, nevertheless, be argued that, due to historical emissions, rights between nations should not be allocated on an equal per capita basis. For a discussion of allocating rights between nations see, for example, Caney (2005) and Page (2008).

Argument 10

- P1*: Today, in the absence of a just society, a fair allocation of rights (or revenue) to adults is one that is equal to the quantity of emissions they would be entitled to release in a just society
- P2*: In a just society, all adults would be entitled to release an equal quantity of emissions
- C*: Today, in the absence of a just society, all adults should be allocated an equal amount of rights or revenue

A detailed discussion of these arguments is beyond the scope of this paper so I confine myself to three brief remarks. First, Premise 2 in Argument 9 clearly does not correspond to the real world and is assumed for the sake of simplicity. Second, if the greenhouse gas removal system was equally owned by all (C2), then there would be a case for children being allocated rights or revenue (Arguments 2 and 3). However, if the greenhouse gas removal system is unowned, and given that adults are responsible for the vast majority of emissions, then it seems reasonable that (the vast majority of) rights or revenue should go to them.¹⁶ But third, and most importantly, even if rights or revenue should go to adults and all adults' energy use had the same emissions factor, most philosophers would not accept Argument 9 as, for them, Premise 1 does not hold.

In Starkey (2008), I explore the support offered for this premise from three leading approaches to distributive justice – right libertarianism, egalitarian liberalism and left libertarianism – and find that none offers straightforward support. For example, many egalitarian liberal philosophers would hold that those individuals who feel the cold and thus need to heat their dwelling to a higher temperature to maintain a comfortable body temperature should, in theory, be entitled to additional energy. And a number of egalitarian liberal philosophers would also hold that those individuals who (1) live rurally and thus need to travel further to live their life or (2) live in a cold region of a country and thus require more energy to heat their dwelling should be entitled to additional energy. Hence, instead of making Arguments 9 and 10, egalitarian liberals would make Arguments 9* and 10*.

*Argument 9**

- P1*: In a just society, adults would be entitled to *differing* quantity of energy
- P2*: All adults' energy use has the same emissions factor
- C*: In a just society, adults would be entitled to release *differing* quantities of emissions

*Argument 10**

- P1*: Today, in the absence of a just society, a fair allocation of rights (or revenue) to adults is one that is equal to the quantity of emissions they would be entitled to release in a just society
- P2*: In a just society, adults would be entitled to release *differing* quantities of emissions
- C*: Today, in the absence of a just society, adults should be allocated *differing* amounts of rights or revenue

Whilst, in theory, the conclusion to Argument 9* might be true, in practice, it might not be possible, or at least it might be too expensive to adjust adults' allocation of rights or revenue to reflect their energy entitlements under egalitarian liberal justice. If so, then for egalitarian

¹⁶ For a discussion of the complexities around this issue, see Starkey (2009).

liberals, EPCA may represent the closest affordable approximation to the unequal allocation that is fairest in theory.¹⁷ Let's call this the *approximation argument* for EPCA.

9. Conclusion

This paper has argued that, from the perspective of contemporary philosophers, the commons arguments described above fail. For libertarians, a move from airspace or sinks as C1 to EPCA is blocked as they regard the world as originally unowned. And even Risse, who argues that the world was originally commonly owned, does not regard the atmosphere as C1 or support EPCA. Furthermore, a move from airspace or sinks as C2 to EPCA for adults is blocked as even egalitarian liberal philosophers do not regard all adults as being entitled to equal quantities of energy. Thus, for egalitarian liberals, the only acceptable argument for EPCA would appear to be the approximation argument.

Whilst such views are hopefully of some philosophical interest, they may also have some real world policy relevance. Over the course of my research into personal carbon trading, numerous people – both climate change professionals and members of the public – have questioned whether, for example, those who live rurally, those who live in colder parts of a country or those with children shouldn't receive additional emissions rights (see Starkey 2008, Section 7.5 and Appendix 3). And in surveys of public opinion on personal carbon trading, a significant number of those questioned took the view that certain adults should receive a greater quantity of emissions rights than others (Bristow et al. 2008, Bird et al. 2009). Thus, there appears to be some convergence between the views of contemporary philosophers and those without a background in academic philosophy.

This evidence regarding public opinion suggests that a government that sought to implement an instrument under which rights or revenue were to be allocated to adults on an equal per capita basis might face significant objections if it sought to justify the instrument on the grounds that its allocation was absolutely fair. Thus, a government might be wise to consider a scheme which allocated rights or revenue differentially or, if this proved not to be feasible/affordable, to seek to justify an equal per capita allocation not as the fairest allocation in theory but simply as the fairest in practice.

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¹⁷ If adults with children are entitled to additional rights or revenue, I presume it would not be excessively expensive to adjust their allocations accordingly. And, thus, the approximation argument would fail. However, there may be egalitarian liberal arguments for not allocating additional rights or revenue to parents (Starkey 2009, particularly Section 7.3.4).

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