RLFP Revista Latinoamericana de Filosofía Política

Centro de Investigaciones Filosóficas

ISSN 2250-8619 • 2023 • Buenos Aires • Argentina

DISTRIBUTING THE BURDENS OF MITIGATING FOSSIL FUEL PRODUCTIONS INSTEAD OF THE REMAINING BENEFITS: A SAFEGUARD FOR CONSERVATISM?

Rutger Lazou

RLFP Revista Latinoamericana de Filosofía Política

Año 2023 — pp. 45-82

ISSN 2250-8619

DISTRIBUTING THE BURDENS OF MITIGATING FOSSIL FUEL PRODUCTIONS INSTEAD OF THE REMAINING BENEFITS: A SAFEGUARD FOR CONSERVATISM?

Rutger Lazou*

Glacisstraße 27/I, 8010, Graz, Austria,

University of Graz

rutger.lazou@uni-graz.at

ABSTRACT

Avoiding dangerous climate change requires that many fossil fuel owners leave their reserves unproduced. This raises important questions of distributive justice. In determining who should be able to produce and who should leave their reserves underground, many ethicists and politicians propose a distribution of mitigation burdens. This article argues that distributing burdens instead of benefits has considerable consequences in favor of the status quo and that, although the literature has uncritically accepted it, the burden-sharing approach is mistaken.

Keywords: 'burden-sharing', 'climate justice, 'distributive justice', 'grandfathering', 'resource-sharing'

---

* Rutger Lazou is a doctoral researcher at the Department of Philosophy and a member of the Doctoral Program "Climate Change" at the University of Graz. He investigates how the transition towards a low-carbon society and economy can be realized in an ethical way. During his research, he executed research stays at the University of Louvain-la-Neuve and the London School of Economics and Political Science. Prior to this, he obtained a Master in Moral Sciences at the University of Ghent in which he specialized in animal ethics. In 2019, he published his book De toekomst van de kat (The Future of Cats), in collaboration with Uitgeverij Houtekiet.

RESUMEN

Evitar el cambio climático peligroso requiere que muchos propietarios de combustibles fósiles dejen sus reservas sin producir. Esto plantea cuestiones importantes de justicia distributiva. Muchos políticos y especialistas en ética proponen que, para determinar quién debería poder producir y quién debería dejar sus reservas bajo tierra, debe discutirse como las cargas de mitigación climática deben ser distribuidas. Este artículo argumenta que distribuir cargas en lugar de beneficios tiene consecuencias considerables a favor del statu quo y que, aunque la literatura lo ha aceptado acríticamente, enfocarse en la distribución de cargas (en lugar de beneficios) es erróneo.

Palabras clave: derechos adquiridos - distribución de cargas - distribución de recursos Justicia climática - Justicia distributiva

1. Introduction

One of the biggest challenges humanity has ever faced is transitioning towards a low-carbon society and economy (Edmond 2020). At least since 1995 (when the IPCC published their second report) (Gosseries 2004), the world got confronted with the knowledge of the dangerous and irrevocable effects of global warming due to the emissions that follow from fossil fuel use: extreme weather events, ruined habitats, higher sea levels, drought, crop failure, heatstroke, increased incidence of diseases, higher weather unpredictability, etc. In 2015 at COP21 in Paris, 195 nations agreed that the average global temperature rise compared to pre-industrial times should be kept 'well below' 2°C and that they will 'pursue efforts' to avoid a difference of 1.5°C (UNFCCC 2015, 3, article 2). From this, we can infer the remaining carbon budget, the amount of greenhouse gas emissions that can still be emitted (Meinshausen et al. 2009). Realizing the 2°C target with a 67% chance would leave us with a budget of 1150 Gt CO_2 (starting from 2020). To not exceed 1.5°C of warming, this would be 400 Gt CO_2. Higher or lower reductions in non-CO2

emissions could slightly increase or decrease these carbon budgets (IPCC 2021, 29).

This implies that we need to mitigate or reduce our emissions of greenhouse gases rapidly. To succeed in this, it is important not only to mitigate fossil fuel consumptions, i.e. engaging in fewer emission-generating activities, but also to mitigate fossil fuel productions, i.e. extracting and selling fewer fossil fuel reserves. Climate activists focus more and more on opposing new fossil fuel extraction infrastructure and economists started to analyze supply-side policies (Lazarus and van Asselt 2018, 2). Focusing on extractions is effective because non-compliance is much easier to avoid, as burning fossil fuels can be done everywhere in the world, in contrast to extracting them out of the ground (Caney 2016, 14). It is easier, in other words, to avoid *leakage*: the problem that, if one introduces mitigation measures in one specific area in the world, productions or consumptions will raise elsewhere.

While consuming fossil fuels has been subject of complex international agreements and negotiations, when it comes to productions, for a long time, the prevailing idea in the international order has been that states can dig up what they want. However, global civil society is increasingly calling for leaving fossil fuels in the ground (Lenferna 2018, 218). A notable initiative to keep fossil fuels in the ground was the Yasuní-ITT Initiative, launched in 2007 by the then president of Ecuador Rafael Correa. It involved Ecuador not engaging in oil extractions in the part of the Yasuní National Park called Ishpingo-Tambococha-Tiputini (ITT), in exchange for being paid €3.7 billion from the international community, i.e. half of the revenue Ecuador would have realized from extracting these reserves. Unfortunately, the initiative has been withdrawn in 2013 because of insufficient economic results, only €345 million had been pledged (Finer, Moncel, and Jenkins 2010; Valencia 2013). This showed that the international community had little motivation to financially support Ecuador's attempt to mitigate productions. Moreover,

governments' domestic measures to mitigate productions are also insufficient to reach the climate goals. Some countries even keep subsidizing fossil fuel extraction projects (Friends of the Earth 2021).

In taking actions to mitigate fossil fuel productions, it is important to take into account justice considerations. Realizing justice not only matters for the sake of justice itself, but also to make the energy transition succeed. If a transition is considered just, this eases the political process (Fay 2015, 21). IPCC (2014, 213) also mentions that perceived fairness facilitates cooperation which may lead to the design of international agreements. According to Kartha et al. (2018, 118), the slow progress on climate action is partly due to the historical inability to resolve equity issues. While for a long time, authors have been focusing only on the ethical aspects of distributing the remaining permissible consumptions, since recently they also pay attention to the question of who can produce the remaining fossil fuels and who should keep its reserves in the ground. A country's number of inhabitants, developmental needs, and past productions are considered relevant criteria, and efficiency may also play a role (Caney 2010; 2016; 2020; Meyer and Roser 2006; Singer 2010). In 2017, a milestone for appeals to climate justice on the production level was reached when academics, analysts, and activists established the *Lofoten Declaration for a Managed Decline of Fossil Fuel Production Around the World*, according to which countries that are high-income and that are responsible for many past productions must show leadership in mitigating productions (The Lofoten Declaration 2017).

Fossil fuel owners who should leave many reserves underground according to these considerations may argue for measures that protect the status quo, like transitional aid, exemptions from new rules, or compensations, an approach that is called 'grandfathering' (Damon et al. 2019, 1; Knight 2013, 1; 2014, 571; Schuessler 2017, 141). To justify these conservative measures, authors have been focusing on liber-

tarian principles, arguing that, for instance, high producers acquired a right to their level of productions (Bovens 2011), on distributive justice, arguing that the status quo is relevant because it influences how good or bad the consequences of a change are (Knight 2014), or on practical considerations, arguing that some grandfathering is required to reach a political agreement.[1] These arguments, however, have been refuted and cannot be considered successful (Damon et al. 2019, 1; Knight 2013, 1; 2014, 571; Schuessler 2017, 141).

One conservative approach, however, has remained unexamined. Regardless of whether they consider themselves conservative or not, many academics and politicians distribute the burdens of mitigating productions instead of the benefits of the remaining permissible productions. These approaches can be called respectively the burden-sharing and resource-sharing approach (Baer 2002, 395). In this article, I criticize the burden-sharing approach. I argue that adopting it has considerable consequences in favor of the status quo (section 2) and that, although the literature has uncritically accepted it (section 3), the burden-sharing approach is mistaken (section 4).

This discussion is relevant on the consumption level too. Nevertheless, I focus on fossil fuel productions because, firstly, the approach of distributing burdens is more frequently used when it comes to productions. The reason for this is that the burdens of a supply-side policy are more visible and concrete as the unrealized benefits were ready to be dug up, so to say. It is relatively easy, in other words, to determine one's unburnable carbon, i.e. the fossil fuels that could have been burnt if there was no need for climate change mitigation, given the availability of fossil fuel reserves (Carbon Tracker Initiative 2011, 2013, 2017; Heede and Oreskes 2016). Adopting the burden-sharing approach, secondly, has more far-reaching consequences on

1. These arguments are usually applied to fossil fuel consumptions, but are also relevant on the production level.

the production level, given the large differences in countries' available fossil fuel reserves. Rejecting the burden-sharing approach on the production level, therefore, is more important than on the consumption level.

2. Why distributing mitigation burdens is conservative

Imagine that you are fond of cherry pies. Every month you order twelve of them. Because the bakers in your neighborhood operate on a small scale, you buy from three different bakers. Bakers A, B, and C supply you with respectively five, four, and three cherry pies per month. They cannot produce more than that. One day, however, your doctor tells you that for health reasons you can only eat six cherry pies a month. You must now decide how many you will continue to buy from which bakers. You would like to go for an equal distribution, but you face a dilemma. You could either distribute the burdens of the doctor's recommendation equally or you could distribute the benefits of producing the remaining cherry pies equally. If you go for the first option, you buy respectively three, two, and one pie(s) from bakers A, B, and C. In this way, each baker misses out on the benefits of producing two cherry pies. However, if you go for the second option, you buy two pies from each. Your choice clearly has implications for the bakers.

In this example, I assume that the marginal benefits and costs of producing these different cakes are the same, i.e. producing any additional cake brings an equal amount of costs and benefits as producing other cakes does. If marginal benefits and costs would decrease, the equal distribution of benefits would be slightly different than in the example. Distributing the burdens equally would also result in a different outcome. The consequences of distributing benefits vs. burdens may be smaller but would still differ considerably.

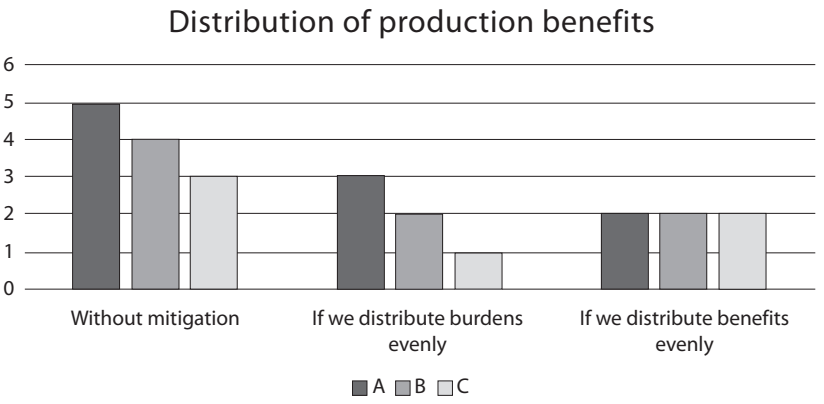

Figure 1 | The distribution of production benefits without mitigation, if we distribute burdens evenly, and if we distribute the remaining benefits evenly.

The difference between distributing benefits and burdens holds independently of which distributive justice principle is applied. In the above analogy, I assumed egalitarianism. One could be critical towards this distributive justice principle. An egalitarian distribution, after all, does not take into account needs, historical considerations, the carbon efficiency of a country's reserves (the amount of carbon that is emitted per unit of energy its combustion delivers), etc. The only reason for assuming an egalitarian distribution in the example above is that this is the simplest way to explain the difference between the burden- and resource-sharing approach. It is important to emphasize that I do not claim that egalitarianism is the right distributive justice principle. This article is only concerned with what should be distributed (benefits or burdens), not with how this should be distributed. These two questions exist independently from each other, whether one distributes benefits or burdens does not have implications for the distributive principle one adheres.

However, which distributive justice principle one assumes or which criteria one takes into account, also determines how conservative one's approach is. In this regard, instead

of rejecting the burden-sharing approach, one might avoid conservative results by distributing burdens in proportion to past productions (or past harms). Taking into account historical considerations, I grant, is justified and indeed reduces conservative implications. However, taking into account responsibility for past productions does not make the burden-sharing approach less problematic. Even if we distribute burdens in proportion to past productions, fossil-fuel rich countries are still enormously advantaged by adopting the burden-sharing approach. If two countries both engaged in many past productions, for instance, but A has much more reserves available than B, the former is still advantaged significantly by adopting the burden-sharing approach.

To illustrate this, imagine that in the cherry cakes example, you take into account the relevance of the past (suppose that the relevant period in the past is as long as the relevant period in the future). A burden-sharing approach that allocates the burdens in proportion to the bakers' past productions benefits would entitle A, B, and C to the benefits of producing respectively 2,5, 2 and 1,5 cakes. In this way, they would bear respectively 41,67%, 33,33% and 25% of the burdens (this equals how much of the past production benefits they enjoyed). A resource-sharing approach could also incorporate historical considerations. If one takes into account that the bakers already received a part of their fair share, A would be entitled to the benefits of producing 1 cake per month, B 2 and C 3, because in this way, each of them benefits from producing 6 cakes a month on average, taking into account both the past and the future. As figure 2 shows, there is an important difference between distributing burdens or benefits, also if one takes into account considerations like the past.

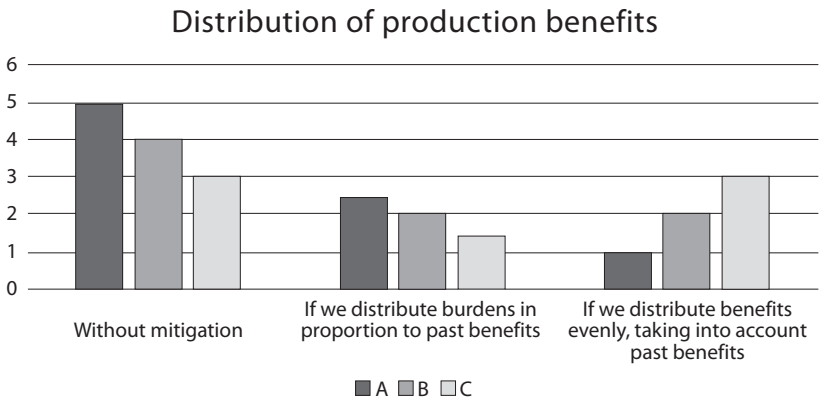

Figure 2 | The distribution of production benefits without mitigation, if we distribute burdens in proportion to past benefits, and if we distribute benefits evenly, taking into account past benefits.

The dilemma to distribute benefits or burdens also arises in the energy transition. The burden-sharing approach distributes the burdens that follow from mitigating climate change. These burdens should be understood as foregone or unrealized benefits, they refer to the burdens of not being able to benefit from engaging into climate harmful activities. In line with this, Caney (2005; 2010; 2018) defines mitigation burdens as "the costs to actors of not engaging in activities that contribute to global climate change. Those who engage in a policy of mitigation bear an opportunity cost: they forego benefits that they could have had if they had engaged in activities which involve the emission of high levels of greenhouse gases" (Caney 2005, 751). For fossil fuel owners, the burdens of mitigating fossil fuel productions consist of not being able to benefit from the energy fossil fuel productions deliver, which could be used domestically or as a source of revenue (Caney 2016, 36-37). These mitigation burdens should be distinguished from other climate change related burdens, like the burdens of unmitigated climate change in terms of adaptation costs or losses and damages. These burdens might

also be normatively relevant, but I do not focus on them in this article.

Keeping fossil fuels in the ground, however, may also cause some benefits. A burden-sharing approach, therefore, actually distributes *net* burdens. Reducing fossil fuel productions avoids the costs of the extraction and production process and has a positive impact on biodiversity and "community and ecological health, sovereignty, and alternative development preferences" (Lenferna 2018, 220). The rights of indigenous peoples to their territory, for instance, are protected. This partly motivated Ecuador to launch the Yasuní-ITT Initiative (cf. section 1). Mitigating fossil fuel productions also reduces the chances to suffer from a concentration of wealth and power, macroeconomic overreliance (also called 'the Dutch disease')[2], and geopolitical instability (Kartha et al. 2016). That countries with a great number of resources often suffer from having these reserves (mostly due to conflicts concerning ownership), is known as the *resource curse* (Wenar 2017). Still, in the short term, the burdens of mitigating productions mostly outweigh these benefits. In the medium to long run, however, there is no reason to think that a zero-carbon economy would be less prosperous than a high-carbon economy, even on a national scale and if we leave out the avoided climate harms (Fay et al. 2015, 154).

The burden-sharing approach is also reflected in approaches that speak of distributing mitigation efforts, responsibilities, sacrifices, or reductions. Another way to adopt the burden-sharing approach is by distributing *stranded assets*. Assets are resources that have value because they will benefit their owner(s) in the future. They could refer to various inputs to

2. When a good is discovered, such as when the Netherlands discovered gas reserves in the North Sea, the influx of foreign cash can lead to an increase of the nation's currency, which can lead to a decrease in exports of other goods (Chen 2020).

production and sources of wealth, including capital, labor, and natural endowments (Colgan, Green, and Hale 2021, 586). Owning these resources has beneficial consequences of an *enduring nature*: it brings benefits or burdens *in the long run*. This makes them vulnerable to being stranded, which means that these assets 'have suffered from unanticipated or premature write-downs, devaluations, or conversion to liabilities' (Caldecott et al. 2013, 7; Caldecott 2017, 2) or, in other words, they 'los[t] economic value well ahead of their anticipated useful life' (Generation Foundation 2013). When a fossil fuel should stay under the ground, it loses its value and becomes a stranded asset.

However, just as in the cherry cakes example, instead of a burden-sharing approach, one could adopt a resource-sharing approach and distribute the benefits of the remaining permissible productions, i.e. the benefits of using the energy these fossil fuel reserves bring domestically or as a source of revenue. These benefits should be distinguished from the benefits of mitigation policies or the benefits of unmitigated climate change. Just as a burden-sharing approach distributes net burdens, a resource-sharing approach distributes *net* benefits, since producing fossil fuels also leads to burdens: it could have a negative impact on biodiversity, lead to political instability, threaten indigenous communities, etc. However, in the short term, as explained, the benefits of producing fossil fuels usually outweigh these costs or negative externalities.

The ultimate difference between the burden- and resource-sharing approach is the assumed baseline. Applied to fossil fuel consumptions, Knight (2013, 9) explains it as follows: "while the baseline for the benefit argument is zero emissions, […] [t]he baseline for the cost argument is the prior level of emissions". The burden-sharing approach, in other words, assumes a baseline of unmitigated climate change, a baseline in which there are no limits to produce fossil fuels, while the resource-sharing approach assumes a baseline of zero productions.

Meyer and Roser (2006, 229) link the burden-sharing approach with the status quo in the following way: "[t]he idea of distributing mitigation burdens —i.e. reductions one has to make relative to the status quo— reveals that the status quo is seen as relevant". What a country would have produced in the future if there was no need for mitigation does not necessarily reflect the prior level of productions (also not when it comes to consumptions). Distributing burdens, therefore, is not conservative because it protects existing benefit rates, but in the sense that it protects the value fossil fuel reserves would have had if there was no need for climate change mitigation.

How much fossil fuel owners would have benefitted from producing their reserves depends on the exposure to the aforementioned burdens and benefits that fossil fuel productions deliver. The most important factor is the availability of fossil fuel reserves. Table 1 shows that many fossil fuels are located in the Middle East (rich in oil and gas), the former Soviet Union countries (rich in oil, gas, and coal), China, India, and the United States (rich in coal).[3] Fossil fuel owners in these countries could realize a large amount of benefits if there was no need for mitigation. Distributing burdens instead of benefits is strongly to their advantage as this preserves the value their reserves would have had.

3. I inferred these data from McGlade and Ekins (2015), who distinguished between the most important regions in the world and investigated where the unburnable reserves are located if stranding would occur in the most cost-effective way. In doing so, they indicated how many % of the total reserves this amounts to. The analysis also differentiated between oil, gas, and coal.

Country or region	Oil (Billions of barrels)	Gas (Trillions of cubic meters)	Coal (Gt)
Africa	110 (8.6%)	13.3 (7.0%)	33 (3.3%)
Canada	54 (4.2%)	1.3 (6.8%)	6.8 (0.7%)
China and India	36 (2.8%)	4.6 (2.4%)	274 (27.4%)
FSU	150 (11.7%)	62 (32.6%)	217 (21.7%)
CSA	149 (11.6%)	9.1 (4.8%)	16 (1.6%)
Europe	25 (2.0%)	5.5 (2.9%)	82 (8.2%)
Middle East	692 (54.0%)	75.4 (39.6%)	3 (0.3%)
OECD Pacific	5.7 (0.4%)	3.9 (2.1%)	89 (8.9%)
ODA	22 (1.7%)	9.2 (4.8%)	29 (2.9%)
USA	47 (3.7%)	7.5 (3.9%)	250 (25.0%)
Global	1282 (100%)	190.2 (100%)	1000 (100%)

Table 1 | Regional distribution of total reserves (based on McGlade and Ekins (2015, 189)). FSU = the former Soviet Union countries, CSA = Central and South America, ODA = Other developing Asian countries, OECD = the Organization for Economic Co-operation and Development, USA = United States of America. A barrel of oil is 0.159 m^3.

To illustrate what sharing resources instead of burdens would imply in practical terms, consider again the Yasuní-ITT Initiative (cf. section 1). This proposal would differ considerably if it assumed a resource-sharing approach. The initiative was not part of a systematic normative framework on who should get what, but what Ecuador claimed it should receive (financial compensations for leaving oil underground) rather demonstrates a burden-sharing approach. Firstly, it presented the mitigation of fossil fuel productions as something costly that has to be funded, instead of presenting the production of fossil fuels as something beneficial that the country has a (limited) right to (a right that may be tradable or possible to sell). Secondly, the money Ecuador proposed to receive seemed

to be determined by the total amount of revenue it would have realized if it produced all the oil reserves located in the Yasuní-ITT area (they proposed to receive half of it) and, thus, by the amount of burdens it bears in this way. In contrast, for a resource-sharing approach, only a country's developmental needs, historical productions, number of inhabitants, and perhaps the efficiency of its reserves matter. This would result in a smaller amount of compensations for Ecuador, since its relatively large amount of total reserves, then, is not taken into account.

3. Why distributing mitigation burdens is uncriticized

Both in international agreements and climate ethics, there is a lot of attention to criteria like historical responsibility and needs and conservative defenses have been elaborately rejected. However, at the same time, many politicians and academics uncritically adopt the burden-sharing approach with its far-reaching conservative implications. Caney (2016), Muttitt and Kartha (2020), and Kartha et al. (2018), for instance, propose to distribute the burdens of not being able to exploit their fossil fuel reserves or how to distribute stranded assets. The Lofoten Declaration affirmed that wealthy countries and countries that produced a lot in the past should bear more of the responsibilities or burdens (The Lofoten Declaration 2017), in line with the *doctrine of Common but Differentiated Responsibilities and Respective Capabilities*, which also offers a framework to equitably share burdens. IPCC's 2014 Assessment Report on climate change mitigation also frames the question in terms of burden-sharing: "efforts are continuing to reach effective international agreement on mitigation. They raise an ethical question that is widely recognized and much debated, namely, 'burden-sharing' or 'effortsharing'. How should the burden of mitigating climate change be divided among countries?".

In line with the burden-sharing approach, many politicians consider the benefits countries would enjoy if there was no mitigation need as relevant for determining their entitlements. Some countries have explicitly referred to the availability of their reserves. At the US-Africa Leaders' Summit in 2014, for instance, the former energy minister of Tanzania, Sospeter Muhongo, argued that "We in Africa, we should not be in the discussion of whether we should use coal or not. In my country of Tanzania, we are going to use our natural resources because we have reserves which go beyond 5 billion tons" (Friedman 2014). Similarly, Canada's prime minister Justin Trudeau contended that "No country would find 173 billion barrels of oil in the ground and leave them there" (McKibben 2020). The huge amount of mitigation burdens they potentially bear, because of the large availability of reserves, does not only motivate these countries to oppose climate change mitigation: they also use it as a justification for mitigating less.[4]

The burden-sharing approach is more easily adopted when productions are at stake, because of the visibility and concreteness of fossil fuel owners' unburnable carbon and the mitigation burdens or foregone benefits they bear. On the consumption level, authors are more likely to distribute benefits, cf. e.g. Torpman (2019; 2020), Moss and Kath (2019) and Singer (2010), although many also distribute burdens, cf. e.g. Caney (2005; 2010; 2018), Shue (1993; 2014), Margalioth and Rudich (2013, 193) who speak of "a just allocation of costs" and Peterson (1999, 167), who investigates "how these sacrifices [should] be distributed". Some frequently defended principles, moreover, are the polluter-pays principle, the beneficiary-pays principle, and the ability-to-pay principle.

4. In contrast, a country like Costa Rica, which does not own a lot of reserves, is less opposed to climate change mitigation. President Carlos Alvarado even considered a ban on fossil fuel explorations and extractions (Garrison 2021).

These principles share the assumption that what has to be distributed are burdens – they discuss who has to pay.

None of these authors explain why they choose to distribute mitigation burdens instead of the remaining benefits, leaving it as if it were irrelevant. Despite the title, even Page's (2008) article *Distributing the burdens of climate change* says nothing about why we should distribute burdens. Authors typically do not only omit to provide reasons for their approach, they do not even mention that there is an alternative. Many do not choose at all and avoid the issue by asking how the benefits and burdens related to climate change mitigation should be distributed. Kartha et al. (2018), for instance, present the two questions: "who should bear the costs associated with curbing extraction to keep within climate limits, and who should enjoy the benefits of extracting the permissible fossil fuels?". Similarly, Caney (2018) asks "What is the fair distribution of the burdens (and benefits) of adopting policies that address climate change?". This suggests that they do not consider the difference between distributing burdens and benefits as relevant.

One author who does pay attention to the difference is Baer (2002, 395). He argues that the burden-sharing approach is problematic because it cannot take into account historical benefits and define what counts as overuse. I disagree that a burden-sharing approach cannot do this. Just as a resource-sharing approach could determine how much one benefitted more than its fair share, a burden-sharing approach could determine how much one has been burdened less than its fair share. This is exactly what Climate Equity Reference Project (2015) has investigated. In particular, it analyzed how much developed countries are burdened less than what their burden should be. The previous section also showed that a burden-sharing approach can take into account the benefits from past production (cf. figure 2). Apart from this consideration, Baer does not indicate a relevant difference between the burden- and resource-sharing approach. Just like the other authors in

the field, thus, he seems to overlook the important difference between sharing burdens and resources.

Only Meyer and Roser (2006, 229) seem to recognize the conservative aspect of distributing burdens. They link the burden-sharing approach with protecting the status quo (cf. section 2), but discuss it only very briefly, as they contend that authors who speak of distributing burdens do not intend to defend conservative measures: "Caney (2005) for example does not imply in any way the appropriateness of status quo rights by using the language of mitigation burdens". However, that Caney and others do not intend to be conservative does not ensure that their views are not. Moreover, that a distribution of burdens in principle *can* be inferred from an initial distribution of benefits (by subtracting the benefits countries may realize from what they would have realized if there was no mitigation need), does not imply that authors do not intend to initially distribute burdens. There is no reason to think that the burden-sharers I mentioned intend to initially distribute benefits.

That a distribution of burdens can be reformulated in terms of a distribution of benefits and vice versa could be one reason why authors overlook the importance of the difference between the two. Elster (1992, 19), for instance, contends that it does not matter whether we distribute benefits or burdens because the exemption from a burden always counts as a benefit and vice versa. One can indeed calculate the necessary reductions (the mitigation burdens) based on the total amount of benefits that would have been realized and the remaining permissible benefits and similarly, one can infer the remaining benefits based on the total amount of benefits that would have been enjoyed minus the reductions. Nevertheless, the amount of allocated benefits and burdens will differ depending on the decision to initially distribute either the remaining benefits or the mitigation burdens.

Another reason why authors overlook the importance of this issue may be that they analyze the relevant criteria

that should be taken into account for determining a fair distribution, without inferring which concrete distribution follows from this. They say, for instance, that the developed countries should bear more burdens, or that the developing countries should receive more remaining benefits, without proposing concrete distributions like 'X should bear this amount of burdens' or 'X should receive this amount of the remaining benefits'. Doing so would confront them with the difference between the two approaches.

4. Why distributing mitigation burdens is mistaken

While the previous sections explained why the approach of distributing the burdens of mitigating fossil fuel productions is conservative and has been uncritically accepted, this section argues that this approach is mistaken and that instead, one should distribute the benefits of the remaining permissible productions. To determine whether we should distribute benefits or burdens, one should consider what is open for distribution and whether this is beneficial or burdensome. When it comes to fossil fuel productions, we should adopt the resource-sharing approach because producing fossil fuels mainly brings benefits (cf. section 2) and these benefits have not been distributed yet. Applied to the consumption level, Meyer and Roser (2006, 226) also argue for the resource-sharing approach because "[i]n order for distributive justice to apply, a certain amount of a given good must be available for distribution. The given good in question here is benefits from emissions". What is open for distribution is not always beneficial. Another important climate change related distributive issue concerns adaptation costs. Having determined the justified climate target, an amount of fossil fuel benefits is open for distribution but also an amount of adaptation costs or burdens, i.e. the costs to reduce the harmful consequences of unmitigated climate change. Similarly, while Meyer and Roser (2006, 224) consider climate

change mitigation as requiring the distribution of benefits, they also think that climate change adaptation requires the distribution of costs.

The burden-sharing approach wrongly assumes that production benefits are distributed already, based on how much one would have benefitted if there was no need for mitigation. It is mistaken, in other words, because it wrongly assumes a baseline of unmitigated climate change. However, just as there exists no distribution of the benefits of producing cherry cakes in the future, the benefits of the remaining permissible fossil fuel productions are not distributed yet. In what follows, I will discuss different arguments for the view that productions benefits are distributed already, which, in my view, are unconvincing.

An anonymous reviewer contends that fossil fuel reserves *are* distributed as public international law determines that natural resources are subject to the sovereignty of states. However, it should first be noted that the sovereignty of states has been criticized. Alternative views consider the agents that own the property under which the resources are located (private individuals, groups of individuals, or companies) as the rightful owners (Caney 2016, 22) or argue that natural resources are owned by all humanity and that the benefits from producing the world's reserves should be shared globally (Beitz 1979, 136–143). Moreover, even if we accept that countries are the initial owners of the resources under their territory and that fossil fuel reserves, thus, are distributed already, this does not mean that the benefits of producing these reserves are also distributed. Recognizing that a country is the rightful owner of a fossil fuel, after all, does not imply that it automatically has a right to produce it. As Caney (2016, 23) explains, "it is widely recognized that there are moral limits on what states may do with the natural resources in their jurisdiction". This includes responsibilities towards future generations, both towards members of their own and of other societies. Imposing the mitigation of fossil

fuel productions, therefore, does not violate states' ownership claims over their resources.

While there are no international regulations or laws about permissions to produce fossil fuels, on the domestic level, states do implement laws and regulations that determine the conditions under which fossil fuel owners could produce their reserves or not. These regulations, arguably, only give rise to entitlements if they are made by a legitimate authority. In political philosophy, the term 'legitimate' has been used frequently in various ways. Legitimate authorities have a right to rule, they can change the normative status of those under its rule (Applbaum 2010). One power the right to rule entails is implementing rules, which imposes obligations on the people to follow these rules and collectively enforce them. It also gives rise to entitlements that others will follow these rules as well. The legitimacy of an authority, arguably, could be grounded on the basis of procedural requirements (Peter 2017). However, even legitimate authorities generate only few entitlements that are relevant for fossil fuel owners, since the regulations they impose typically only concern what is permissible or not at the moment that they are in play and not what will be permissible in the future. Only in exceptional cases, for instance, in the case of temporary regulations, it is indicated that a rule will be applied in the future (Schulev-Steindl and Hofer 2021). This is not the case for permissions about producing fossil fuels. There are only entitlements, thus, about fossil fuel productions that already occurred. If the regulations change, they may no longer generate entitlements to produce fossil fuels.

Perhaps agreements between states and companies entitle one to benefit from producing fossil fuels. These agreements are typically made in the form of contracts, i.e. agreements that are legally binding. They differ from each other depending on the jurisdiction of the state in which the relevant fossil fuels are located, the kind of fossil fuels, and whether they are located under the land or the sea. Typically, states agree

that companies may do explorations in their territory and produce the reserves they find. In turn, companies agree to pay a fixed sum or a share of the benefits they realize from these productions. These permissions are usually granted in the form of licenses of a limited duration of about five years (Schlumberger Oilfield Glossary 2022). In this way, however, these agreements only entitle fossil fuel owners to benefit from producing a very limited amount of their reserves.

Even if there were more international and/or domestic regulations or contracts about future production permissions, moreover, they would arguably only lead to entitlements if they are compatible with justice, so they cannot entitle one to benefit more from productions than distributive justice allows. Many authors consider justice relevant. According to Moore (2017, 232f.), inferring entitlements from any accepted legal rule would be too permissive. Being legally entitled to own slaves in the southern United States of America in the 19th century, for instance, did not give one a moral right to own these people. Similarly, Matravers (2017, 312) contends that if a college, for instance, institutes 'burning at the stake' as the declared penalty for missing chapel, this does not entitle the community (for whom it is beneficial that people attend chapel) that people get burnt when missing chapel, even if this rule had the correct procedural origin. The same holds for permissions to produce fossil fuels. Unjust regulations and contracts about production permissions, insofar as they exist, should not be taken into account in determining the requirements of distributive justice.

Another argument raised by a reviewer contends that fossil fuel reserves have an actual value based on *expectations* about their value. There is a distribution of production benefits, in other words, based on what can be expected given the current economic and legal circumstances, which justifies that we distribute the burdens of not being able to realize these benefits, the argument goes. Sharing the burdens of stranded assets relies on expectations by definition, since

stranded assets are assets that suffer from devaluations that are *unanticipated* (unexpected) or *premature* (earlier than expected). Having stranded assets, thus, is nothing more than having unfulfilled expectations. This argument, however, needs a further explanation about why these expectations matter. In this regard, authors have focused on the concept of *legitimate expectations*, expectations that are normatively relevant or cannot be ignored. If an expectation is legitimate, it should be fulfilled, or some kind of compensation or an apology is required (Meyer and Sanklecha 2014, 371–372).

Some authors derive the legitimacy of an expectation from the interest to have this expectation fulfilled. These accounts are forward-looking as they infer duties and entitlements from the position people are in and their capacities to improve a state of affairs, regardless of its causes (Goodin 1995; Shue 2017, 2). Sidgwick (1962, 128), for instance, contends that expectations create duties that they should be satisfied. Moore (2017, 235–236) also contends that the strong human interest in having stable background conditions and future-oriented projects gives rise to the entitlement or right that one's expectations become fulfilled. She relies on the interest theory of rights, according to which interests ground rights, if the interests are sufficiently weighty to hold others under a duty (Moore 2017, 230; Raz 1986). Meyer and Truccone-Borgogno (2022) propose a similar view according to which expectations have normative weight dependent on the extent to which the frustration of these expectations undermines the ability to plan, whether it infringes basic moral rights, and on the costs it imposes on its bearers. Applied to the transition towards a low-carbon society, they argue that people's expectations justify a deviation in the baseline of justice. Gosseries and Hungerbühler (2006, 106) also contend that people's expectations about the stability of legal rules give rise to normative claims.

However, the interest in having one's expectations fulfilled, I contend, does not justify changes in what distributive justice requires. If one expects to benefit from fossil fuel productions,

this does not entitle one to produce more than one would otherwise have a right to. If baker A expects that you will buy all her cakes, this does not oblige you to buy from her and stop buying from B and C. Moore (2017, 247) anticipates this criticism: "Doesn't the legitimate expectations argument have the counter-intuitive consequence that it legitimizes unfair allocations simply on the grounds that people have come to expect them?". To discuss this issue, Moore (2017, 249–251) introduces the examples of people expecting to find a job that fits with the skills they invested in and people expecting that the partner they are married to will stay with them. For these people, it is very important that these expectations get fulfilled, but this does not ground a right that they will be fulfilled. To avoid this conclusion, Moore argues that it is a fundamental feature of a market economy and of the institution of marriage that people bear the risk that their skills will not be required in the market and that marriage contains a right to unilateral exit.

I think that merely expecting things could never generate duties of justice. By merely focusing on interests, I contend, one could only ground positive duties of charity. As traditionally understood in ethics, positive duties are duties to act in certain ways or duties to assist, in contrast to negative duties, which are duties not to act in certain ways or duties of noninterference (De Smet et al. 2015, 420; Shue 2017, 2). If one has no special responsibility, these positive duties to fulfill one's expectations are only duties of charity/supererogation (De Smet et al. 2015, 422). This means that it is laudable or good to fulfill an expectation, but it is not required by justice, the expecting agent does not have a *right* to have one's expectations fulfilled. Expectations about production benefits, thus, do not entitle one to those benefits and cannot justify the claim that these benefits are distributed already.

This does not mean that expectations cannot be normatively relevant. Backward-looking views, which focus on what has already occurred (Shue 2017, 2), in my view, *can* justify duties

of justice by focusing on who is responsible for having created expectations about future production benefits. Given the value of having correct expectations for one's ability to make and execute plans, causing false expectations typically harms the expecting agent. When governments are responsible for companies' false expectations about regulatory stability, I argue, the harm can be considered wrongful and they should provide compensations that are limited to the costs of relying on these expectations. If baker A expects that I will buy all her cakes, made investments based on this expectation, and I can be held responsible for these expectation-related costs (which is the case, arguably, if I could have foreseen and avoided it), her expectation is legitimate and compensatory justice requires me to compensate these costs. Similarly, fossil fuel owners' expectations could also justify compensations for investments in fossil fuel explorations and extractive infrastructures. Importantly, these costs or losses are much smaller than the foregone benefits and are not relevant for determining the fair distribution of the remaining production benefits.

Taking into account the distribution or outcome that would have occurred or was expected to occur if there was no need for climate change mitigation is not only mistaken but also arbitrary, as one could presuppose many other non-existing distributions that could have occurred in a counterfactual world. For instance, instead of assuming a world that is not threatened by climate change, one could assume a world with different technologies or with different economic circumstances. The production benefits realized in these different counterfactual worlds differ a lot. Fully producing the world's *reserves*, i.e. resources that are proved to be recoverable[5] under current technological and economic

5. Fossil fuel resources are considered proved recoverable if they have a specific probability (at least 90%) of being produced. Probably recovera-

conditions, would lead to an estimated 2734.2 Gt CO_2 (Heede and Oreskes 2016, 15) or 2900 Gt CO_2 (Caldecott et al. 2013; Meinshausen et al. 2009; Raupach et al. 2014). However, producing all the world's *resources*, i.e. the fossil fuels that are recoverable over all time with both current and future technologies regardless of existing economic conditions, would lead to 11000 Gt CO_2 emissions (11 times the carbon budget) (McGlade and Ekins 2015, 187-188). One could thus presuppose multiple counterfactual worlds that each lead to a different outcome and it is arbitrary to assume one of those outcomes but not another one.

Perhaps a relevant difference is that the distribution of production benefits assuming unmitigated climate change is not possible due to *normative* considerations instead of physical, economic, or technological limits, which might give this counterfactual world a special status. In most cases, limits are physical: when one has to distribute an amount of food, for instance, this amount depends on physical availability. When it comes to the benefits of engaging in emission-generating activities or fossil fuel ownership, limits are normative:

> "Nature by itself does not set a 'natural' stopping point for our emitting greenhouse gases. This is different in many other cases of distributive justice where the good in question is strictly (or somewhat) limited, such as land or GDP. So, if there is to be a maximum limit on emissions it has to be determined normatively" (Meyer and Roser, 2006, 226)

Few would propose to distribute the burdens of physical limits. If a country owns reserves that are physically unextractable, for instance, there is not much discussion that this should not affect the fair distribution of production

---

ble resources have a probability of at least 50% of being produced, possibly recoverable resources are at least 10% likely to be produced (McGlade and Ekins 2015; Society of Petroleum Engineers 2018, 13).

benefits. Limits of a normative nature, in contrast, are treated differently. However, it is unclear why it would be relevant whether a reserve is unextractable because of physical or normative reasons. Moreover, when physical limits are considered in the long run, to some extent, they become normative. The limits to food production or land use, for instance, are partly determined by normative considerations.

Even if we were to accept that one counterfactual world has a special status, e.g. the world without the need for climate change mitigation and with the current economic and technological circumstances, there would still be the pragmatic problem that it is difficult to determine what the distribution would have been in this situation. If one wants to distribute burdens, one needs to know how many benefits the relevant agents would have enjoyed in the hypothesized situation. However, as Pye et al. (2020, 2) indicate, there are huge uncertainties around future productions and revenues. It is difficult, for instance, to determine what counts as proved recoverable resources (reserves). Many resources that McGlade and Ekins (2015) consider reserves, Heede and Oreskes (2016, 13) argue, are located in nations that lack the productive capacity to exploit them. The term 'proved', they contend, is vague and misleading as nothing is proved until a reserve has been extracted and sold. Instead, they focus on the reserves that are reported by the largest producers around the world, i.e. the companies that are ready to develop, produce, refine, and deliver those fuels to global markets in the near future. Heede and Oreskes rely on publicly available data that have been reported under this rubric. From this, they infer still another carbon bubble, one that amounts to (only) 1615.167 Gt CO_2.

Another pragmatic disadvantage of distributing burdens concerns the psychological effects it causes. In contrast to the normative aspects of distributing benefits or burdens, this psychological concern has been given significant attention. According to the article of Sondak, Neale, and Pinkley (1995)

The Negotiated Allocation of Benefits and Burdens: The Impact of Outcome Valence, Contribution, and Relationship and the article of Northcraft, Neale, Tenbrunsel, and Thomas (1996) *Benefits and burdens: Does it really matter what we allocate?* distributing benefits or burdens has a psychological effect on how people react to a certain distribution. Sondak et al. (1995) found that when one allocates burdens, negotiators respond in similar ways as they do when experiencing negative events. Northcraft et al. (1996) also found significant differences in the information processing of burdens and benefits: individuals react stronger to losses than to gains and require much more in exchange for accepting a burden or paying to avoid a burden compared to what they require to forgo a benefit or pay to gain a benefit. This psychological effect also seems to hold in the case of mitigating climate change. Think, for instance, of the resistance of the United States and George W. Bush's reaction to the question of what he was going to do about global warming: "I'll tell you one thing I'm not going to do is I'm not going to let the United States carry the burden for cleaning up the world's air" (Singer 2010). If instead, he considered how much of the remaining benefits the United States could claim, there might have been more willingness to cooperate.

5. Conclusion

Avoiding the devastating consequences of climate change requires the world to leave many fossil fuel reserves unproduced. This gives rise to the important question of who should be able to produce and who should leave its reserves in the ground. Existing views focus on the relevance of a country's number of inhabitants, past productions, developmental needs, and the efficiency of producing its reserves. Conservative views that protect the current value of fossil fuel reserves have been overwhelmingly rejected, except for one: the approach

of distributing mitigation burdens instead of the remaining permissible benefits. This article explained why the burden-sharing approach is strongly conservative and argued that although authors have uncritically accepted it, it is mistaken.

The burden-sharing approach distributes the burdens of mitigating productions, i.e. the net burdens of not being able to benefit from engaging into climate harmful activities. It is also reflected in approaches that distribute production reductions, responsibilities, efforts, sacrifices, or stranded assets. In contrast, the resource-sharing approach distributes the benefits of the remaining permissible productions, i.e. the benefits fossil fuel productions bring in terms of energy that can be used domestically or for gaining revenue. While resource-sharers assume a baseline of zero benefits, the burden-sharing approach assumes a baseline of unmitigated climate change: it considers the benefits that fossil fuel reserve owners would have realized if there was no need for mitigation normatively relevant. Because of the large differences in the amounts of reserves different countries have, these benefits differ significantly. For countries with many reserves like the United States, India, China, and countries in the Middle East and the former Soviet Union, distributing burdens instead of benefits is very advantageous, as it protects the value these reserves would have had.

Despite its conservative consequences, many academics and politicians uncritically accept the burden-sharing approach. They adopt it more easily on the production level than when it comes to consumptions, as the mitigation burdens or foregone benefits are more visible and concrete, ready to be dug up. They do not justify their approach, most likely because they do not consider the difference between distributing burdens or benefits as relevant. They might overlook the importance of this difference because a distribution of burdens can be reformulated in terms of a distribution of benefits and vice versa or because they analyze the relevant criteria without inferring a concrete distribution.

Distributing the burdens of mitigating productions, however, is mistaken. It wrongly assumes a baseline of unmitigated climate change, in which production benefits are distributed already. Although fossil fuel reserves can be considered as distributed, this does not necessarily hold for the benefits of producing them. Neither laws nor contracts entitle fossil fuel owners to the benefits of future productions, since laws typically do not concern the future and contracts only concern the near future and since, arguably, they should be just before they lead to entitlements. That there exist expectations about the benefits of fossil fuel productions, based on the value of fossil fuels in the current economic and legal circumstances, does not imply that production benefits are distributed either. These expectations are simply mistaken and they do not justify a deviation of what distributive justice requires. At most, they may justify compensations for wrong investments, if they are legitimate, i.e. if another agent can be held responsible for causing the expectation-related harm.

Assuming a world in which climate change mitigation is not needed is not only mistaken but also arbitrary as one can presuppose several other non-existing worlds, for instance, with different economic and technological circumstances. These counterfactual worlds would lead to very different outcomes and assuming one of them would be arbitrary. In this regard, it is unclear why it would matter whether these worlds cannot be realized due to normative or physical limits. Even if one picks one counterfactual world, moreover, it would be difficult to estimate who would have benefitted to what extent. Another disadvantage of adopting the burden-sharing approach is the psychological effect that it causes more resistance. Distributing the burdens of mitigating fossil fuel productions, therefore, is not a justified safeguard for conservatists. Instead, one should distribute the benefits of the remaining permissible productions.

Acknowledgments

I am grateful to my colleagues at the University of Louvain-la-Neuve, who gave me the opportunity to present this article at the 'Vives Seminar' and my colleagues at the University of Graz and the Sant'Anna School of Advanced Studies Pisa, for who I could present the article at the conference 'Transitional, Distributive, and Compensatory Justice in Responding to Global Challenges'. Special thanks go to Lukas Meyer, Carlotta Garofalo, and Pierre André for their valuable feedback. I also want to thank the editors and two anonymous reviewers. Finally, I acknowledge the Austrian Science Fund (FWF), which funded this work under Research Grant W1256 (Doctoral Programme Climate Change: Uncertainties, Thresholds and Coping Strategies).

REFERENCES

Applbaum, Arthur. I. 2010. 'Legitimacy without the Duty to Obey.' *Philosophy & Public Affairs*, 38 (3): 215–239. <https://doi.org/10.1111/j.1088-4963.2010.01186.x>.

Baer, Paul. 2002. 'Equity, Greenhouse Gas Emissions, and Global Common Resources'. In *Climate Change Policy*, 393–408. Washington.

Beitz, Charles R. 1979. *Political Theory and International Relations: Revised Edition*. REV-Revised. Princeton University Press. <https://doi.org/10.2307/j.ctvcm4hkf>.

Bovens, Luc. 2011. 'A Lockean Defense of Grandfathering Emission Rights'. In *The Ethics of Global Climate Change*, edited by Denis G. Arnold, 124–44. Cambridge University Press.

Caldecott, B., N. Howarth, and P. McSharry. 2013. 'Stranded Assets in Agriculture: Protecting Value from Environment-Related Risks'. <https://ora.ox.ac.uk/objects/uuid:4496ac03-5132-4a64-aa54-7695bfc7be9d>.

Caldecott, Ben. 2017. 'Introduction to special issue: stranded assets and the environment'. *Journal of Sustainable Finance & Investment* 7 (1): 1–13. <https://doi.org/10.1080/20430795.2016.1266748>.

Caney, Simon. 2005. 'Cosmopolitan Justice, Responsibility, and Global Climate Change'. *Leiden Journal of International Law* 18 (4): 747–75.

———. 2010. 'Climate change and the duties of the advantaged'. *Critical Review of International Social and Political Philosophy* 13 (1): 203–28. <https://doi.org/10.1080/13698230903326331>.

———. 2016. 'Climate change, equity, and stranded assets'. *Oxfam America Research Backgrounder Series*. <http://www.oxfamamerica.org/explore/research-publications/climate-change-equity-and-stranded-assets>.

———. 2018. 'Distributive Justice and Climate Change'. In *Oxford Handbook of Distributive Justice*, edited by Serena Olsaretti. Oxford University Press.

———. 2020. 'Climate Justice'. In *The Stanford Encyclopedia of Philosophy*, edited by Edward N. Zalta, Summer 2020. Metaphysics Research Lab, Stanford University. <https://plato.stanford.edu/archives/sum2020/entries/justice-climate/>.

Carbon Tracker Initiative. 2011. 'Unburnable Carbon: Are the World's Financial Markets Carrying a Carbon Bubble?' <https://carbontracker.org/reports/carbon-bubble/>.

———. 2013. 'Wasted Capital and Stranded Assets'. <https://carbontracker.org/reports/unburnable-carbon-wasted-capital-and-stranded-assets/>.

———. 2017. 'Stranded Assets'. Carbon Tracker Initiative. 2017. <https://www.carbontracker.org/terms/stranded-assets/>.

Chen, James. 2020. 'Understanding Dutch Disease'. *Investopedia*, 2020. <https://www.investopedia.com/terms/d/dutchdisease.asp>.

Climate Equity Reference Project. 2015. 'Fair Shares: A Civil Society Equity Review of INDCs'. <https://policy-practice.

oxfam.org/resources/fair-shares-a-civil-society-equity-review-of-indcs-579848/>.

Colgan, Jeff D., Jessica F. Green, and Thomas N. Hale. 2021. 'Asset Revaluation and the Existential Politics of Climate Change'. *International Organization* 75 (2): 586–610. <https://doi.org/10.1017/S0020818320000296>.

Damon, Maria, Daniel H. Cole, Elinor Ostrom, and Thomas Sterner. 2019. 'Grandfathering: Environmental Uses and Impacts'. *Review of Environmental Economics and Policy* 13 (1): 23–42. <https://doi.org/10.1093/reep/rey017>.

De Smet, Andries, Jo Dirix, Lisa Diependaele, and Sigrid Sterckx. 2015. 'Globalization and Responsibility for Human Rights'. *Journal of Human Rights* 14 (3): 419–38. <https://doi.org/10.1080/14754835.2014.988786>.

Edmond, Charlotte. 2020. 'These Are the Top Risks Facing the World in 2020'. *World Economic Forum*, 2020. <https://www.weforum.org/agenda/2020/01/top-global-risks-report-climate-change-cyberattacks-economic-political/>.

Elster, Jon. 1992. *Local Justice: How Institutions Allocate Scarce Goods and Necessary Burdens*. Russell Sage Foundation.

Fay, Marianne. 2015. *Decarbonizing Development*. <http://archive.org/details/decarbonizing>.

Fay, Marianne, Stephane Hallegatte, Adrien Vogt-Schilb, Julie Rozenberg, Ulf Narloch, and Tom Kerr. 2015. 'Decarbonizing Development'. <http://archive.org/details/decarbonizing>.

Finer, Matt, Remi Moncel, and Clinton N. Jenkins. 2010. 'Leaving the Oil Under the Amazon: Ecuador's Yasuní-ITT Initiative'. *Biotropica* 42 (1): 63–66. <https://doi.org/10.1111/j.1744-7429.2009.00587.x>.

Friedman, Lisa. 2014. 'Africa Needs Fossil Fuels to End Energy Apartheid'. *Scientific American*, 2014. <https://www.scientificamerican.com/article/africa-needs-fossil-fuels-to-end-energy-apartheid/>.

Friends of the Earth. 2021. 'Tip of the Iceberg: The Future of Fossil Fuel Extraction'. <https://policy.friendsoftheearth.uk/insight/tip-iceberg-future-fossil-fuel-extraction>.

Garrison, Cassandra. 2021. 'Costa Rica Eyes Permanent Ban on Fossil Fuel Exploration and Extraction'. *Reuters*, 4 August 2021, sec. Americas. <https://www.reuters.com/world/americas/costa-rica-eyes-permanent-ban-fossil-fuel-exploration-extraction-2021-08-04/>.

Generation Foundation. 2013. 'Stranded Carbon Assets: How Carbon Risks Should Be Incorporated in Investment Analysis'. <https://www.genfound.org/media/1374/pdf-generation-foundation-stranded-carbon-assets-v1.pdf>.

Goodin, Robert E. 1995. *Utilitarianism as a Public Philosophy*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511625053>.

Gosseries, Axel. 2004. 'Historical Emissions and Free-Riding'. *Ethical Perspectives: Journal of the European Ethics Network* 11: 36.

Gosseries, Axel, and Mathias Hungerbühler. 2006. 'Rule Change and Intergenerational Justice'. In *Handbook of Intergenerational Justice*, edited by Joerg C. Tremmel, 106–128. Edward Elgar Publishing.

Heede, Richard, and Naomi Oreskes. 2016. 'Potential emissions of CO2 and methane from proved reserves of fossil fuels: An alternative analysis'. *Global Environmental Change* 36 (January): 12–20. <https://doi.org/10.1016/j.gloenvcha.2015.10.005>.

IPCC. 2014. 'AR5 Climate Change 2014: Mitigation of Climate Change'. <https://www.ipcc.ch/report/ar5/wg3/>.

IPCC. 2021. 'Summary for Policymakers'. In *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by MassonDelmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou. Cambridge University Press.

Kartha, Sivan, Simon Caney, Navroz K. Dubash, and Greg Muttitt. 2018. 'Whose Carbon Is Burnable? Equity Considerations in the Allocation of a "Right to Extract"'. *Climatic Change* 150 (1): 117–29. <https://doi.org/10.1007/s10584-018-2209-z>.

Kartha, Sivan, Michael Lazarus, and Kevin Tempest. 2016. 'Fossil Fuel Production in a 2°C World: The Equity Implications of a Diminishing Carbon Budget', September. <https://www.sei.org/publications/equity-carbon-budget/>.

Knight, Carl. 2013. 'What is grandfathering?' *Environmental Politics* 22 (3): 410–27. <https://doi.org/10.1080/09644016.2012.740937>.

———. 2014. 'Moderate Emissions Grandfathering'. *Environmental Values* 23 (5): 571–92.

Lazarus, Michael, and Harro van Asselt. 2018. 'Fossil Fuel Supply and Climate Policy: Exploring the Road Less Taken'. *Climatic Change* 150 (1): 1–13. <https://doi.org/10.1007/s10584-018-2266-3>.

Lenferna, Georges Alexandre. 2018. 'Can we equitably manage the end of the fossil fuel era?' *Energy Research & Social Science*, Energy and the Future, 35 (January): 217–23. <https://doi.org/10.1016/j.erss.2017.11.007>.

Margalioth, Yoram, and Yinon Rudich. 2013. 'Close Examination of the Principle of Global Per-Capita Allocation of the Earth's Ability to Absorb Greenhouse Gas'. *Theoretical Inquiries in Law* 14 (1). <https://doi.org/DOI: 10.1515/til-2013-011>.

Matravers, Matt. 2017. 'Legitimate Expectations in Theory, Practice, and Punishment.' *Moral Philosophy and Politics*, 4 (2): 307–323. <https://doi.org/10.1515/mopp-2017-0017>.

McGlade, Christophe, and Paul Ekins. 2015. 'The Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming to 2 °C'. *Nature* 517 (7533): 187–90. <https://doi.org/10.1038/nature14016>.

McKibben, Bill. 2020. 'When It Comes to Climate Hypocrisy, Canada's Leaders Have Reached a New Low | Bill

McKibben'. *The Guardian*, 5 februari 2020, sec. Opinion. <https://www.theguardian.com/commentisfree/2020/feb/05/when-it-comes-to-climate-hypocrisy-canadas-leaders-have-reached-a-new-low>.

Meinshausen, Malte, Nicolai Meinshausen, William Hare, Sarah C. B. Raper, Katja Frieler, Reto Knutti, David J. Frame, and Myles R. Allen. 2009. 'Greenhouse-Gas Emission Targets for Limiting Global Warming to 2 °C'. *Nature* 458 (7242): 1158–62. <https://doi.org/10.1038/nature08017>.

Meyer, Lukas H., and Pranay Sanklecha. 2014. 'How Legitimate Expectations Matter in Climate Justice'. *Politics, Philosophy & Economics* 13 (4): 369–93. <https://doi.org/10.1177/1470594X14541522>.

Meyer, Lukas H., and Dominic Roser. 2006. 'Distributive Justice and Climate Change. The Allocation of Emission Rights'. *Analyse & Kritik* 28 (2): 223–49. <https://doi.org/10.1515/auk-2006-0207>.

Meyer, Lukas H., and Santiago Truccone-Borgogno. 2022. 'Legitimate Expectations: Assessing Policies of Transformation to a Low-Carbon Society'. *Environmental Values* 31: 1–20. <https://doi.org/10.3197/096327122x16386102424001>.

Moore, Margaret. 2017. 'Legitimate Expectations and Land.' *Moral Philosophy and Politics*, 4 (2): 229–255. <https://doi.org/10.1515/mopp-2017-0002>.

Moss, Jeremy, and Robyn Kath. 2019. 'Historical Emissions and the Carbon Budget'. *Journal of Applied Philosophy* 36 (2): 268–89. <https://doi.org/10.1111/japp.12307>.

Muttitt, Greg, and Sivan Kartha. 2020. 'Equity, climate justice and fossil fuel extraction: principles for a managed phase out'. *Climate Policy* 20 (8): 1024–42. <https://doi.org/10.1080/14693062.2020.1763900>.

Northcraft, Gregory B., Margaret A. Neale, Ann Tenbrunsel, and Melissa Thomas. 1996. 'Benefits and Burdens: Does It Really Matter What We Allocate?' *Social Justice Research* 9 (1): 27–45. <https://doi.org/10.1007/BF02197655>.

Page, Edward A. 2008. 'Distributing the burdens of climate change'. *Environmental Politics* 17 (4): 556–75. <https://doi.org/10.1080/09644010802193419>.

Peter, Fabienne. 2017. 'Political Legitimacy.' In *The Stanford Encyclopedia of Philosophy*, edited by Edward N. Zalta. Metaphysics Research Lab, Stanford University. <https://plato.stanford.edu/archives/sum2017/entries/legitimacy/>.

Peterson, E. Wesley F. 1999. 'The Ethics of Burden-Sharing in the Global Greenhouse'. *Journal of Agricultural and Environmental Ethics* 11 (3): 167–96. <https://doi.org/10.1023/A:1009570100135>.

Pye, Steve, Siân Bradley, Nick Hughes, James Price, Daniel Welsby, and Paul Ekins. 2020. 'An Equitable Redistribution of Unburnable Carbon'. *Nature Communications* 11 (1): 3968. <https://doi.org/10.1038/s41467-020-17679-3>.

Raupach, Michael R., Steven J. Davis, Glen P. Peters, Robbie M. Andrew, Josep G. Canadell, Philippe Ciais, Pierre Friedlingstein, Frank Jotzo, Detlef P. van Vuuren, and Corinne Le Quéré. 2014. 'Sharing a Quota on Cumulative Carbon Emissions'. *Nature Climate Change* 4 (10): 873–79. <https://doi.org/10.1038/nclimate2384>.

Raz, Joseph. 1986. *The Morality of Freedom*. Oxford University Press. <https://oxford.universitypressscholarship.com/view/10.1093/0198248075.001.0001/acprof-9780198248071>.

Schlumberger Oilfield Glossary. 2022. 'Licensing Round'. <https://glossary.oilfield.slb.com/en/terms/l/licensing_round>.

Schuessler, Rudolf. 2017. 'A Luck-Based Moral Defense of Grandfathering'. In *Climate Justice and Historical Emissions*, edited by Lukas H. Meyer and Pranay Sanklecha, 141–64. Cambridge: Cambridge University Press. <https://doi.org/10.1017/9781107706835.008>.

Schulev-Steindl, Eva, and Miriam Hofer. 2021. 'Legitimate Expectations from a legal perspective: Obstacles to a carbon-free society or necessity to safeguard individual freedom?' (presentation at the University of Graz).

Shue, Henry. 1993. 'Subsistence Emissions and Luxury Emissions'. *Law & Policy* 15 (1): 39–60. <https://doi.org/10.1111/j.1467-9930.1993.tb00093.x>.

———. 2014. *Climate Justice: Vulnerability and Protection*. Oxford, New York: Oxford University Press.

———. 2017. 'Responsible for What? Carbon Producer CO2 Contributions and the Energy Transition'. *Climatic Change* 144 (4): 591–96. <https://doi.org/10.1007/s10584-017-2042-9>.

Sidgwick, Henry. 1962. *The Methods of Ethics: book III*. London: MacMillan.

Singer, Peter. 2010. 'One Atmosphere'. In *Climate Ethics: Essential Readings*, edited by Stephen Gardiner, 1 edition. Oxford ; New York: Oxford University Press.

Society of Petroleum Engineers. 2018. 'Petroleum Resources Management System'. <https://www.spe.org/en/industry/petroleum-resources-management-system-2018/?aliId=eyJpIjoiTnRVbkRcL3FyMmQxemI3azgiLCJ0IjoiYW5kUmJUZFVhclZyV1dBd2JtQmtnQT09In0%253D>.

Sondak, Harris, Margaret A. Neale, and Robin Pinkley. 1995. 'The Negotiated Allocation of Benefits and Burdens: The Impact of Outcome Valence, Contribution, and Relationship'. *Organizational Behavior and Human Decision Processes* 64 (3): 249–60. <https://doi.org/10.1006/obhd.1995.1103>.

The Lofoten Declaration. 2017. 'The Lofoten Declaration: A Global Call for Climate Leadership'. The Lofoten Declaration. <http://www.lofotendeclaration.org/>.

Torpman, Olle. 2019. 'The Case for Emissions Egalitarianism'. *Ethical Theory and Moral Practice* 22 (3): 749–62. <https://doi.org/10.1007/s10677-019-10016-8>.

———. 2020. 'Isolationism and the equal per capita view'. *Environmental Politics* 0 (0): 1–19. <https://doi.org/10.1080/09644016.2020.1785809>.

UNFCCC. 2015. 'The Paris Agreement'. <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>.

Valencia, Alexandra. 2013. 'Ecuador to Open Amazon's Yasuni Basin to Oil Drilling'. *Reuters*, 16 August 2013, sec. Environment. <https://www.reuters.com/article/us-ecuador-oil-idUSBRE97E15220130816>.

Wenar, Leif. 2017. *Blood Oil: Tyrants, Violence, and the Rules That Run the World*. Reprint edition. Oxford University Press.

Received: January 10, 2022
Reviewed: April 27, 2023
Accepted: June 30, 2023