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Should centimillionaires bear (most of) the burden of international climate finance?

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Abstract

In the recent debate about who should provide international climate finance (ICF) to developing countries on concessional terms, some have argued that the ultra-rich should cover a significant proportion of the associated costs. This would apply regardless of the climate responsibilities or level of development of the countries in which the ultra-rich reside. In this article, I examine whether the rich-pay-for-ICF proposal aligns with any reasonable viewpoint on climate justice. To do so, I test the claim against a hybrid model of remedial responsibility for climate change that combines outcome responsibility and the ability to pay. I argue that the rich-pay-for-ICF proposal can be justified on normative grounds by distinguishing between the weighty and frivolous interests of emitters and investors, and by adopting a broad and objective view of equal sacrifice. Finally, I propose a global policy toolbox for implementing the rich-pay-for-ICF proposal in a manner consistent with the aforementioned hybrid model of responsibility.

Keywords: climate justice; extreme wealth; international climate finance; just taxation; luxury emissions.

1. Introduction

According to the Independent High-Level Expert Group on Climate Finance (2024: 5; 2022: 4), developing countries and emerging economies (excluding China) will require approximately $1 trillion per year in cross-border finance for climate action by 2030, rising to $1.3 trillion by 2035. This funding would enable these countries to follow an emissions trajectory consistent with the Paris Agreement's mitigation targets, implement adaptation measures, compensate victims of unavoidable climate losses and protect ecosystems at risk from higher temperatures (see also Alayza et al. 2024). It is reasonable to assume that approximately half of this cross-border finance could come from private investment. The remainder will have to be mobilised from the public coffers of developed countries on a more or less concessional basis (Independent High-Level Expert Group on Climate Finance 2024: 5-6) – e.g. in the form of grants, concessional loans, concessional equity investments and blended finance (Michaelowa and Sacherer 2023; Pauw et al., 2022). This raises the normative question of who should bear the burden of so-called international public finance for climate action, or international climate finance (ICF) for short, and on what basis (Michaelowa 2022; Browne 2022; Gordon 2022).

The Conference of the Parties – COP – to the United Nations Framework Convention on Climate Change – UNFCCC – has so far addressed the issue of ICF burden sharing through what could be

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called a state-led approach. The first stage of this approach involves the COP Parties discussing which countries should contribute to ICF and by how much. Thus far, the COP has distinguished between Parties that are obliged to bear the costs of ICF — the burden-bearing countries — and those for which mobilising ICF is supererogatory (Zou et al. 2024; Ives and Hall 2024). The burden-bearing countries are listed in Annex II to the UNFCCC (1992). These countries consist of OECD members at the time minus Turkey and plus the EU. The original intention was to ensure that the ICF burden would mainly fall on countries that had historically contributed the most to the accumulation of greenhouse gases (GHGs) in the atmosphere, and/or had the greatest capacity to mobilise economic, technological, and other resources for climate action. In COP terminology, this is encapsulated by the principle of common but differentiated responsibilities and respective capabilities — CBDR-RC (Vanderheiden 2015: 31–34). However, the Annex II classification is no longer sufficiently aligned with the CBDR-RC principle as it excludes some of the world's richest and most polluting countries, such as the United Arab Emirates, Saudi Arabia and China. One of the main issues at stake in current COP negotiations is therefore whether emerging economies should be considered burden-bearing countries (Patel 2024). The second stage of the state-led approach involves each burden-sharing country allocating its national share of ICF costs to its resident population. This issue has not been addressed by the COP in its decisions. However, since the CBDR-RC principle is used to determine which countries bear the ICF burden, it can be inferred that these countries must allocate their national share of the burden to their resident populations in a manner consistent with the same principle (Chakraborty 2025). The precise determination of this allocation can be based on a variety of considerations, including the country's own views on domestic justice.

The state-led approach has so far resulted in a series of landmark decisions within the UNFCCC, not all of which have been honoured (Shishlov and Censkowsky 2022). The first ICF target was adopted at COP15 in Copenhagen in 2009, when Annex II countries pledged to raise $100 billion per year by 2020 to fund mitigation and adaptation projects in developing countries (UNFCCC 2009: Art. 8). At COP21 in Paris in 2015, the parties agreed to negotiate a new collective quantified goal (NCQG) for international climate finance by 2025, using $100 billion per year as a floor (UNFCCC 2015: Decision 1/CP.21, Art. 53). At COP26 in Glasgow in 2021, the parties recognised ‘with deep regret’ that the $100 billion target had not been met (UNFCCC 2021: Art. 21). According to OECD (2024) estimates, Annex II countries reached the $100 billion target in 2022 (almost $116 billion), only two years late. However, Oxfam (2023a) shadow reports have questioned the OECD's calculation methodology, arguing that the OECD takes loans into account at face value rather than at their grant equivalent, and that it overestimates the climate component of financial flows. At COP29 in Baku, the parties called on all countries, including emerging economies, to significantly increase finance mobilisation for climate action in developing countries, aiming for at least $1.3 trillion per year by 2035 (UNFCCC 2024: Art. 7). In turn, Annex II countries have committed to taking the lead by mobilising at least $300 billion per year by 2035 in climate finance for developing countries from various sources, including public and private, bilateral and multilateral sources, as well as special sources such as liquidity created through the IMF's special drawing rights and international taxation (UNFCCC 2024: Art. 8).

The state-led approach has not only shaped the practical implementation of ICF burden-sharing at the UNFCCC level, but also the way it has been theorised in climate justice literature (Colenbrander et al. 2021; Gajevic Sayegh 2019; Dellink et al. 2009; Grasso 2009; Baatz 2018; Vanderheiden 2015). Recently, however, some economists, such as Gabriel Zucman (2024; see Harvey 2024) and Laurence Tubiana (2024; see Prakash 2024), have implicitly challenged this

approach to ICF burden-sharing. They have argued that the ultra-rich should contribute a significant proportion of ICF costs, regardless of the level of development or emissions record of their country of residence — we can refer to this as the rich-pay-for-ICF (RPICF) proposal. Supporters of the RPICF proposal tend to focus on the fact that wealth is taxed regressively at the global level, with those at the top of the global wealth pyramid paying a lower proportion of their earnings in tax than everyone else (Mager 2025). This is considered unfair by any reasonable theory of vertical equity, including those that advocate a flat tax rate (see Murphy and Nagel 2002: 13-30). A simple way to correct (at least in part) this injustice would be to shift a large portion of the ICF costs onto the ultra-rich. More specifically, the fair taxation argument in favour of the RPICF proposal is based on three key facts. First, the ultra-rich derive most of their income from financial capital rather than labour, and the former is generally subject to much lower taxation than the latter (Hourani 2023; Saez and Zucman 2019). Second, through tax loopholes such as unearned capital gains and personal wealth holding companies, many ultra-rich individuals manage to avoid taxation altogether (Zucman 2024: 12–16). Third, the ultra-rich pay taxes on their own emissions at a much lower percentage of their income than all other consumers, where such taxes exist (Blanchard et al. 2023: 691).

There are two main reasons why the RPICF proposal clashes with the state-led approach to ICF burden-sharing. Firstly, many of the ultra-rich reside in countries that do not belong to the Annex II list and, more generally, do not qualify as burden-sharing countries according the CBDR-RC principle. This means that under the state-led approach, these individuals are not under much obligation to contribute towards ICF costs. Secondly, international tax competition makes it difficult for any country to allocate its share of ICF costs to the ultra-rich residing within its borders. This is because the ultra-rich could threaten to relocate or simply move their assets to countries offering more favourable tax conditions (Jaarte 2024; Wallace and Welton 2024: 1223-1227). Therefore, implementing the RPICF proposal would require a large number of countries to synchronise their tax policies on wealth, emissions and/or investment, targeting only the ultra-rich (Zucman 2024: 37–40; see also Tubiana 2024). I will refer to this as the social-cluster approach to ICF burden-sharing.

The limitation of the just taxation argument in favour of the RPICF proposal is that it treats climate action spending as social welfare spending, i.e. as something to which those who have more have a *prima facie* duty to contribute proportionally more (Halliday 2013: 1114-1118). However, climate change involves the infliction of harm, which calls for (among other things) specific responsibilities from those who emitted and/or benefited from emissions (Caney 2010a; Shue 2017; von Allmen 2022). The article's objective is to ascertain whether the RPICF proposal is compatible with at least one reasonable principle (or combination of principles) of climate justice, rather than being based on a more general ideal of just taxation. For this purpose, I will examine whether the RPICF proposal can be grounded in a hybrid model of remedial responsibility for climate change, applying the contributor pays principle to recent emissions and the ability to pay principle to historical emissions (see Caney 2010b; Heyward 2021: 128–130; Page 2008). For short, I will refer to this as the hybrid shift model. Demonstrating that the RPICF proposal is compatible with the hybrid shift model does not conclusively prove that it is a just proposal from a climatic perspective. Indeed, one might wish to defend alternative principles of climate justice that do not support the RPICF proposal. The aim of this article is simply to examine whether the RPICF proposal can be considered legitimate within the climate justice debate.

The article will proceed as follows. In Part 2, I will briefly discuss a series of empirical facts that appear to render the RPICF proposal incompatible with the standard principles of climate justice, and more specifically with the hybrid shift model. In Parts 3 and 4, I will present normative arguments as to why the RPICF proposal can be reconciled with the hybrid shift model. Part 5 will outline a policy toolbox through which the RPICF proposal can be implemented in a way that is consistent with the hybrid shift model of responsibility. However, before that can happen, the RPICF proposal needs to be made more specific. So far, the RPICF proposal has been presented in rather general terms. It is unclear who the ultra-rich are, whether this includes not only (USD) billionaires but also (USD) centimillionaires, and how much of the ICF cost they should cover. I will discuss a version of the RPICF proposal in which centimillionaires bear at least 50% of the costs of mobilizing ICF. For the purposes of this discussion, I will define a centimillionaire as any individual with at least $100 million in liquid assets. An asset is liquid if it can be easily and quickly converted into cash; therefore, bank deposits, short-term bonds and marketable securities are liquid assets, whereas real estate and property are not necessarily liquid assets. According to Henley & Partners (2024), approximately 300,000 individuals meet this definition, representing 0.001% of the world's population. I will refer to everyone else as the rest of society.

2. The rich-pay-for-ICF (RPICF) proposal and the climate justice challenge

People usually have a strong moral intuition that you can't just get away with the mess you make: you should at least clean it up, or pay to have it cleaned up (Shue 2014:182-183). More specifically, individuals are considered to be bound by a duty not to cause harm to others, where this is reasonably avoidable (Kilcullen 1981). If this duty is breached, compensation is due under the contributor pays principle (Shue 2015: 11-14; Kyllönen 2018; Kok-Chor 2023). However, there are situations where this is not so straightforward. For example, when the person who performed the harmful action(s) is no longer present to compensate and/or they cannot be considered to be outcome-responsible for the negative consequences of the action (Meyer and Roser 2010: 241-246; Kingston 2014). In particular, the latter condition applies when the person who caused harm did not have sufficient control over their actions (e.g. the emissions we produce when we breathe) and/or could not reasonably have foreseen that the action would cause harm to someone (Miller 2007: 87-90). In such cases, two principles are key to determining who is responsible for remedying the harm: unjust enrichment and ability to pay. According to the unjust enrichment principle, anyone who has benefited from an injustice (e.g., a more or less knowingly inflicted harm) has a duty to disgorge that benefit, otherwise they become an accomplice to the injustice (Truccone 2024: 156-178; Duus-Otterström 2024a). Instead, according to the ability to pay principle those within a social group who have more resources to solve a collective problem must contribute proportionately more (Moellendorf 2022: 87-90; Shue 2014: 186-189).

One way of reconciling the different moral intuitions underlying these principles is the hybrid shift model of remedial responsibility (see Caney 2010b; Heyward 2021: 128-130; Page 2008). According to this model, we can identify a historical point beyond which people have reasonable access to scientific knowledge about climate change. This is usually taken to be around 1990, when the first IPCC report on the climate-altering effects of GHG emissions was published. People can only be considered outcome-responsible for emissions after 1990, or recent

emissions, but not for emissions before 1990, or historical emissions.[2] Therefore, responsibility for remedying recent emissions (hereafter referred to as the "recent emissions burden") should be distributed according to the contributor pays principle. Meanwhile, responsibility for remedying climate harm attributable to historical emissions (hereafter referred to as the "historical emissions burden") should be distributed according to either the unjust enrichment principle or the ability-to pay-principle. In practice, there is little difference between the latter two principles. Indeed, it could be argued that almost all of today's wealth is, so to speak, tainted by historical emissions (Baatz 2013: 102). Given that wealth is easier to measure than the benefits of emissions, I will focus on the ability to pay principle for purely practical reasons.

In order to argue that the RPICF claim is compatible with the hybrid shift model, we must explain why centimillionaires should bear a greater proportion of the ICF burden than their recent emissions or wealth relative to the global total. I will refer to this as the proportionality challenge. The per capita emissions of centimillionaires are disproportionately higher than those of anyone else. For example, a study of 20 billionaires found that these individuals emitted an average of 8,000 tonnes of CO_{2e} per year (Barros and Wilk 2021). In contrast, the global upper middle class (the top 10% of global emitters) emits an average of 29 tCO_{2e} per year, whereas the global rich (the top 1%) emit 101 tCO_{2e} per year (Chancel 2022). This huge disparity in per capita emissions between centimillionaires and everyone else is partly due to the fact that this small global elite indulges in expensive, carbon-intensive goods such as superyachts, private jets, mega-mansions and supercars, which are beyond the means of the rest of society (Hormio 2024: 111–115). However, it is also known that centimillionaires represent only 0.001% of the world's population, and the top 0.1% of emitters currently account for just 4% of global emissions (Chancel 2022). Furthermore, although the wealth of centimillionaires is growing much faster than that of others (Oxfam 2025), they control just over 6% of global wealth, compared to the almost 38% controlled by the top 1% of the global population (World Inequality Lab 2022: 22).

3. The contributor pays principle: weighty vs. frivolous interests

If a group of people causes collective harm, we might argue that each group member should compensate the victims in proportion to how much their actions contributed to the harm. This would appear to render the RPICF claim incompatible with the contributor-pays component of the hybrid shift model. However, I will contend that a qualitative argument about responsibility for collective climate harm can help address the proportionality challenge raised by the RPICF proposal. More specifically, I will defend an interest-based version of the contributor pays principle that is applicable specifically to the climate case. Like the standard version, this qualified version acknowledges that if a group of individuals carry out actions that, when combined, cause diffuse climate harm, each group member has a *prima facie* duty to compensate for this harm in proportion to their contribution to it. However, it also states that if some members caused harm for frivolous reasons, political authorities would be justified in demanding more than proportional compensation from these members. This is for both communicative and forward-looking reasons.

I will argue that we should assess the weight of the reasons behind an action that generates emissions by examining how much giving up the action would interfere with a person's ability to lead a flourishing life. A person leads a flourishing life when they thrive in various areas that are

[2] For a critical view on this, see Zellentin 2015.

widely regarded as ends in themselves, rather than means to more fundamental goals, and that are almost universally considered essential for a life to have value (Arneson, 1999). Drawing on a combination of empirical studies and theoretical assessments, the main constituents of flourishing can be identified as mental and physical health, satisfaction, purpose in life, close social relationships, and character and virtue (Höltge et al. 2022; VanderWeele 2017).[3]

I will firstly discuss how the interest-qualified contributor pays principle applies to both consumption and financed emissions, i.e. emissions to which one contributes by investing in or lending money to the activities of others. I will then argue why this qualified version of the contributor pays principle may support the RPICF claim.

3.1 Consumption emissions

We can distinguish between weighty and frivolous emission-generating actions. An emission-generating action is weighty if it significantly contributes to a person achieving or maintaining a state of flourishing. Conversely, an emission-generating action can be considered frivolous if it is either substitutable or redundant in terms of a person's flourishing. An emission-generating action is substitutable if it can be replaced by a less emission-generating action without the individual giving up the specific contribution to flourishing that the original action aimed to provide. An emission-generating action is redundant with respect to a person's flourishing if, although it cannot be replaced in the above sense, renouncing the action would not prevent the individual from either achieving or maintaining a state of flourishing. This distinction is not intended to be exhaustive; it overlaps with other normatively relevant distinctions that can be found in the literature on climate justice. For example, it could be argued that weighty emissions which serve to satisfy basic needs are weightier morally than emissions that contribute to someone's flourishing by satisfying non-basic needs (Shue 2014: 47–67). Similarly, within emissions that do not serve basic needs, it has recently been argued that those that support the important life projects of the global middle class are weightier morally than those that support what most people would define as luxury preferences (Francis 2025). The definition of weighty emissions that I propose here provides an objective, flourishing-based explanation of what constitutes an important enough reason for emitting to deserve consideration by society. Frivolous emissions, in contrast, refer to those that have too little moral weight to be of significance. I will therefore argue that inflicting climate harm without a significant moral reason gives rise to special compensatory obligations for both communicative and forward-looking reasons. Two examples may help to illustrate this.

> *Weighty emissions*. Marco, who was born and raised in Croatia, has received a job offer in Norway. Taking up this position would enable him to achieve many more of his life's ambitions than the best job he could get in Croatia would allow. However, maintaining close ties with his family in Croatia is also important to Marco. In order to live a flourishing life, he needs to combine the job in Norway with frequent train journeys to Croatia. Taking the job in Norway would therefore result in an increase of X in Marco's annual emissions compared to if he had stayed in Croatia.
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> *Frivolous emissions*. Carlos is a wealthy Argentinian who leads a flourishing life, meaning that he has ample opportunity to do good in all key domains of life. He wants to use his private jet to watch the Argentinian national team play in the 2022 FIFA World Cup final in

[3] See also Fruh and Hedahl (2013) and Fragnière (2018), who discuss the moral importance of life projects in emissions decisions.

> Qatar. Above all, he wants to see his sporting idol, Lionel Messi, lift his first — and, given his age, likely final — World Cup. This would result in an increase of Y in Carlos's annual emissions compared to watching the match at home.

Both X and Y emissions violate the no-harm duty. Marco and Carlos can choose whether to emit or not; not emitting would not prevent them from meeting their basic needs. Therefore, either of them could invoke the right to emit in self-defence (Gardiner 2017: 445–447). However, while Marco's emissions have moral weight, Carlos's do not. If Marco were to give up X emissions, he would experience significant repercussions in at least one constituent of flourishing: satisfaction, purpose in life, or close social relationships. It would also be difficult for him to make up for this by pursuing alternative courses of action. Conversely, if Carlos were to give up Y, he would not be significantly worse off in the two main domains affected by his decision to fly privately to Qatar, namely satisfaction and purpose in life. For example, Carlos could travel by scheduled flight to watch the football match he wants to see. This renders the difference in emissions between private and scheduled flights substitutable. Furthermore, even if he gave up watching the match live and simply watched it on television, Carlos would still have a variety of alternative, lower-emission activities from which he could derive a similar level of satisfaction and purpose in life. Therefore, renouncing Y would not prevent Carlos from flourishing. However, it could be argued that Carlos may have other reasons for travelling to Qatar by private jet besides just watching the match. For instance, he may want to flaunt his wealth in front of the world. Flying to the FIFA World Cup in a private jet alongside thousands of other ultra-rich individuals would be an effective way to do so. In reply, we could argue that Carlos could reasonably choose to show off his social status in a way that is much less damaging to the environment. He could, for example, buy works of art or luxury accessories to post on social media, pay for advertising space in traditional media outlets, set up foundations or finance start-ups.

In summary, from a human flourishing perspective, the opportunity cost of complying with the no-harm duty is much higher for Marco with respect to X than for Carlos with respect to Y. Some philosophers invoke axiological claims like this to justify normative arguments about the permissibility of climate harm. For instance, one could argue that Marco's interest in producing X is more important than the aggregate interests of climate victims in avoiding the diffuse and imperceptible harm caused by X, meaning that Marco could permissibly produce X. The same, however, would not be true for Carlos producing Y, as the reasons for Y are much weaker (see Fragnière 2018: 657–658; Fruh and Hedahl 2013: 281–285). However, I will not address the thorny issue of the permissibility of climate harm here. Even if certain circumstances were to render climate harm permissible, this would not negate the obligation to compensate for it to some extent (Gardiner 2016: 124).

I shall contend that both Marco and Carlos should compensate victims of climate change, but Carlos should be required to do so to a greater extent. Indeed, both Carlos and Marco prioritise their own interests over those of climate victims, who suffer diffuse harm. However, given Marco's weighty interest in producing X, we cannot infer from his choice that the interests of climate victims count for nothing to him. Rather, we can infer that the interests of others in avoiding a marginal increase in diffuse harm are less important to him than the benefits he expects from X. Conversely, since Carlos' interest in producing Y emissions is frivolous, we must infer from his prioritisation of the different interests at stake that the interests of climate victims are almost entirely irrelevant to him. More specifically, Carlos is not willing to spare others an increase in diffuse harm, even though doing so would not pose a significant obstacle to him

leading a flourishing life. This suggests that Carlos's emissions are not only harmful, but also problematic in terms of how this harm is justified. In addition to the climate harm he causes, Carlos commits an expressive wrong against victims of climate change by failing to recognise their moral standing (see Axelsen and Nielsen 2024). Conversely, Marco does not negate the moral standing of victims of climate change; he simply weighs his personal interests against those of others on the basis of a proportionality factor greater than one. This is part of human psychology and is generally accepted in social dynamics, provided it is done within certain limits (Fragnière 2018: 657).

Governments should hold people accountable not only for the material harm caused by their emissions, but also for the associated expressive wrongs, for two reasons. Firstly, there are communicative reasons. The message conveyed by the ultra-rich's frivolous emissions is morally objectionable: not only do they value the interests of others less than their own, they value them not at all. Any government could have easily used its power to prevent the ultra-rich from producing such emissions within its borders. For instance, it could have banned private jets from taking off from or landing at its airports, or it could have imposed heavy taxes on them. It could also have prohibited superyachts from mooring in its ports and mega-houses from being built. At the same time, governments could have reached agreements with each other to harmonise policies and combat frivolous emissions while avoiding carbon leakage across borders. However, no government has done this, or at least attempted to do so meaningfully. If a government allows expressive wrongdoing to be perpetrated systematically when it has the chance to stop it, it becomes complicit and commits expressive injustice (Axelsen and Nielsen 2024: 306). When it comes to deciding how to share the costs of remedying the negative effects of emissions accumulated in the atmosphere to date, governments can take a stand against the expressive wrongs embedded in frivolous emissions and correct the expressive injustice they have allowed to happen. One way to do this would be to distinguish between weighty and frivolous emitters and allocate a proportionally larger share of the recent emissions burden to the latter. This should not be seen as a punishment, but rather as a means by which public authorities can redistribute responsibility for emissions so as to distance themselves from the expressive wrong of frivolous emissions and prevent expressive injustice from occurring.

Secondly, there are forward-looking reasons. In order to keep global warming within acceptable risk limits, countries must set ambitious mitigation targets. Many countries have already done so, while others are under pressure to follow suit. Implementing these targets will require individuals to embrace the ambitious collective endeavour of the climate transition and change their behaviour accordingly. However, the fact that a large proportion of the emissions budget compatible with global and national mitigation targets is still being used to produce frivolous emissions undermines the narrative of collective endeavour. This could lead people to draw two conclusions. On the one hand, they may believe that the richest people are exempt from shared climate responsibilities. Alternatively, they may doubt the urgency of the climate crisis, reasoning that if it were truly an emergency, we would have started eliminating the most obvious and substantial source of emissions — frivolous emissions — without hesitation. Either belief could undermine people's commitment to the climate transition. Therefore, governments have *pro tanto* reasons to dispel such concerns and ensure that the climate transition is fair and inclusive. One way to achieve this would be to ensure that those who emit for frivolous reasons bear a greater burden than others in remedying recent emissions.

3.2 Emissions financing

As soon as humans realised that their greenhouse gas (GHG) emissions were causing climate change, they should have taken action for the benefit of themselves, future generations and the natural world (Bourban 2023). Crucially, they should have ceased exploring for, exploiting and selling fossil fuels, invested heavily in renewable energy, introduced ambitious climate change legislation, and promoted more sustainable production, consumption and waste management practices (Frumhoff et al. 2015; Shue 2017, 2021). Yet the opposite has happened. Over the last thirty-five years, fossil fuel exploration and exploitation has increased (Milman and Lakhani 2024; Carbon Tracker 2022). Although renewable energy production has grown, it still accounts for less than a third of global electricity generation (Roser et al. 2024). The climate policies adopted by governments are still largely insufficient to minimise climate risks at a reasonable cost (Climate Action Tracker 2024). This delayed transition means that many people have no alternative but to emit in order to realise their weighty interests. Returning to the previous example, if most of Europe's energy production were green today, Marco could work in Norway, keep in touch with his family in Croatia and fulfil his duty to avoid causing climate harm.

It could be argued that people have a second-order duty to avoid delaying the transition to a low-carbon economy if they can do so at reasonable cost (Bernstein 2025; Fahlquist 2009). This duty is based on the moral intuition that it is wrong to force others to choose between pursuing their significant interests and preventing harm to others (see Duus-Otterstöm 2024b: 287). However, I will not address the issue of balancing responsibility for violating the second-order duty not to delay the climate transition with responsibility for violating the first-order duty not to emit when this can be reasonably avoided. In particular, I will not discuss whether, or to what extent, breaching the second-order duty by one or more individuals reduces the climate harm responsibility of those who emitted due to a lack of low-cost alternatives. I will merely state that those who have breached the second-order duty must bear part of the recent emissions burden. As with the first-order duty not to cause unnecessary harm through emissions, however, a qualitative distinction must be made between facilitating climate harm through financing emissions for weighty and frivolous reasons, respectively. Let us consider two other cases.

> *Weighty emissions financing*. Sarah is a small business owner. She must decide whether to invest in a plastic manufacturing plant or an organic farm. She chooses the plastic factory because it is the more profitable option. She has two young children and is worried that she might not be able to afford to give them a good education.
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> *Frivolous emissions financing*. Saanvi is very wealthy. She leads a wonderful life and can afford everything that is important to her, including lavish luxuries. She must decide whether to invest in a green or a 'dirty' fund. Both investments would increase her wealth, but the dirty fund would do so more quickly. Saanvi chooses the dirty investment.

Both Sarah and Saanvi violate the second-order duty not to delay the climate transition. However, while Sarah violates this duty in order to do well with respect to one of the constituents of flourishing — purpose in life — Saanvi violates it while already doing well with respect to all constituents of flourishing. This raises the same issue of expressive wrongs as analysed in relation to consumption emissions. While Sarah prioritises her weighty interests over those of others in transitioning to a fossil-free energy regime, Saanvi prioritises her frivolous interests over those of others. Therefore, we may infer from Saanvi's prioritisation that she attaches virtually no importance to speeding up the climate transition. As with consumption emissions, both communicative and forward-looking reasons support placing a proportionally greater share of the recent emissions burden on those who delay the transition through frivolous emissions financing. Firstly, if governments allow the message that the transition to a fossil-free energy

regime is unimportant to be conveyed despite having the opportunity to prevent it, they end up legitimising it. As this message conflicts with solid arguments of justice, governments should actively distance themselves from it. Secondly, while governments continue to implicitly endorse the message embedded in frivolous emissions financing, people may question the value of calls for rapid climate action and the associated policies. This could undermine people's commitment to participating in the collective endeavour to transform energy systems.

3.3 The interest-based contributor pays principle and centimillionaires

In summary, there are three reasons why the emissions of the ultra-rich are qualitatively different from those of everyone else. These reasons justify them bearing a major share of the burden of remedying recent emissions, based on the interest-qualified contributor pays principle. Firstly, most of the recent emissions produced by centimillionaires are substitutable because they have had access to a wide range of less polluting alternative options they could have chosen without losing the opportunity to flourish in all key domains of life (see Lynch et al. 2019; Barros and Wilk 2021). Secondly, the majority of recent emissions produced by centimillionaires are redundant because they have been produced in optimal conditions for flourishing. Thirdly, centimillionaires have violated the second-order duty not to delay the climate transition to a much greater extent and for much more frivolous reasons than the rest of society. This is because almost all financial capital is in the hands of the global top 1%, and increasingly so in the hands of the ultra-rich. The rest of society also owns capital, but mainly in the form of real estate (Kenner 2019; Oxfam, 2022).

4. The ability to pay principle and equal sacrifice from centimillionaires

Thus far, I have argued that the interest-qualified contributor principle enables us to conclude that centimillionaires should bear a greater proportion of the recent emissions burden than their emissions account for. However, in order to argue that the RPICF proposal is compatible with the hybrid shift model, we must still explain why centimillionaires should bear the historical emissions burden to a much greater extent than their collective wealth relative to that of the rest of society. According to the hybrid shift model, people are not outcome-responsible for historical emissions. Therefore, responsibility for remedying these emissions should be assigned according to the ability to pay principle, whereby the wealthier an individual is, the more they should contribute to a social endeavour (Shue, 2014, p. 186). The use of the ability to pay principle to distribute the burden of historical emissions is grounded in the more general equal sacrifice principle. This principle states that if a group of people must collectively bear a burden for which none of them is morally responsible, there is no inherent reason why some should bear a greater individual burden than others (Murphy and Nagel 2002: 24–28).

In order for the RPICF proposal to be compatible with the ability-to-pay component of the hybrid shift model, we must justify a tax rate curve that rises steadily across the global population's percentiles, increasing more sharply once it reaches the final percentile — specifically targeting centimillionaires. I shall contend that two arguments, one axiological and one empirical, can justify a RPICF-aligned tax curve based on the equal sacrifice principle. First, the saturation argument. A monetary sacrifice can be measured using either a subjective or an objective currency, depending on one's beliefs about what gives value to a human life (Arneson 1999). Subjective currencies take into account happiness and desires, while objective currencies consider a range of things that are universally regarded as important for individuals, regardless of their personal views on them. When measuring the sacrifices people would make to remedy

historical emissions, I submit that we should adopt an objective currency such as human flourishing because it is not influenced by expensive tastes, adaptive preferences, etc. (Corvino et al. 2021). It is reasonable to assume that human flourishing reaches a saturation point with respect to economic resources. Once a person has hit this threshold, acquiring additional economic resources does not lead to greater flourishing. In other words, it does not result in any significant improvement in the domains of life that are constituents of flourishing (Robeyns 2022; Timmer 2021). Therefore, giving up an equal proportion of one's economic resources is a far smaller sacrifice for those above the saturation point than for those below it. The exact location of this threshold is the subject of both empirical and theoretical investigation (Robeyns, 2019, pp. 253–254). It is possible that not only centimillionaires, but also some simple millionaires are above this threshold. However, it is also reasonable to assume that centimillionaires are much more firmly above the saturation point and would remain so even if they took on at least half of the historical emissions burden, all other things being equal. Consequently, the RPICF taxation curve, which rises and then peaks in correspondence with centimillionaires, appears to be compatible with the equal sacrifice principle at first consideration.

Secondly, there is the argument of indirect burden. When we say that sacrifices for a collective endeavour should be shared equally, we can take either a narrow or a broad view. The former considers only the burden that a tax imposes on those who pay it. The latter considers the consequences of taxation for individuals who are more or less directly linked to those who pay. In the case of climate action, I would argue that the broad view is more appropriate because of the systemic consequences that climate action has for society. Much of centimillionaires' wealth is held in liquid assets, whereas much of the rest of society's wealth is held in illiquid assets. As previously mentioned, successfully achieving the mitigation targets set out in the Paris Agreement requires developed countries to provide significant financial resources to developing countries on an annual basis, immediately. Liquid assets can be converted into cash more quickly than illiquid assets, with less loss of value. Therefore, taxing illiquid assets poses a greater risk of financial stress than taxing liquid assets, as people may be forced to dispose of assets such as real estate and business holdings quickly. Such sudden and unexpected changes to the socio-economic environment could indirectly burden the less well-off, such as employees and low-income consumers. Moreover, introducing additional taxation on illiquid assets suddenly implies efficiency losses, making society as a whole worse off (Listokin 2011; Loutzenhiser and Mann 2021). A society with less overall wealth will have fewer resources available to achieve socio-economic justice through distributive policies, such as ensuring that everyone has a decent standard of living (see Gosseries 2023: 139). Therefore, if shifting the at least half of the historical emissions burden onto centimillionaires does not impose a significant sacrifice on them from an objective perspective and can simultaneously reduce the risk of financial stress for those less well off and increase societal wealth, there are *pro tanto* reasons to adopt a RPICF-aligned tax curve within a hybrid shift model of remedial responsibility for climate change. This does not imply, of course, that the rest of society should not contribute to remedying historical emissions, it merely suggests that their overall contribution should be less than that of centimillionaires.

5. The RPICF policy toolbox

In Parts 3 and 4, I argued that the RPICF claim could be derived from the hybrid shift model of remedial responsibility for climate change. If this is correct, the RPICF claim would align with at

least one plausible interpretation of climate justice. I will now address the issue of implementation. As previously mentioned, applying the RPICF claim necessitates shifting from a state-led approach to ICF burden-sharing to a social-cluster approach. The latter involves a coalition of willing countries coordinating policies to raise revenue from centimillionaires, which should cover the majority of ICF costs. I will now discuss how a global policy toolbox can be designed to be consistent with the hybrid shift model. For brevity, I will refer to this as the RPICF toolbox.

Firstly, coalition countries must coordinate the implementation of an annual minimum wealth tax on centimillionaires residing in their territories (see Piketty 2014; Brand 2016; and Chancel et al. 2024). This tax would ensure that centimillionaires bear the historical emissions burden in a manner consistent with the equal sacrifice logic underpinning the ability to pay principle. In fact, it would only target individuals who are well above the saturation point of flourishing and who have substantial liquid assets to draw on. A relatively low tax rate would suffice. Zucman (2024: 24–27), for instance, estimates that a 2% tax on the wealth of centimillionaires could raise up to USD 300 billion, even in a scenario involving significant tax evasion. However, it should be noted that revenues raised by the proposed ICF wealth tax will presumably be lower than those raised by Zucman's tax, since he defines a centimillionaire as anyone owning at least USD 100 million in any form, not just liquid assets. Nevertheless, even if the ICF wealth tax raised one third less than Zucman's tax due to the narrower tax base, it would still cover a significant proportion of the ICF costs induced by historical emissions. According to Zucman (2024: 22–24), there are three methods by which a government can collect a 2% ICF wealth tax from centimillionaires residing within its borders. The first method is to estimate the total wealth owned by centimillionaires and tax it at 2% each year. The second method is to assume that centimillionaires earn a certain percentage of their wealth each year as economic income (e.g. around 6%), regardless of whether these gains are realised or reinvested, and to tax this presumed income at a relatively high rate (e.g. over 30%). For the RPICF toolkit, it is important that the taxation of the presumed income of centimillionaires amounts to at least 2% of their wealth. The third method involves estimating the actual income of centimillionaires using a flexible definition of income that includes unrealised capital gains and dividend transfers from large companies to holding companies. This income is then taxed as in the first method.

Secondly, coalition countries must coordinate the implementation of a minimum carbon tax on the financial assets of centimillionaires residing in their territories (see Starr et al. 2023; Neves and Semmler 2021). This tax would ensure that centimillionaires are held accountable for their emissions financing in a manner consistent with the interest-qualified contributor pays principle. This is because most of centimillionaires' investments are considered frivolous emissions financing, as previously defined. The asset-based carbon tax rate for ICF is not discussed here, as this involves balancing a government's ambition to reduce emissions financing with the revenue it wants to raise for ICF. One straightforward way to measure the emissions associated with a financial asset would be to multiply the emissions rate of each company activity by the average emissions embedded in that activity, and then divide the result among shareholders in proportion to their asset ownership (see Farbstein et al. 2025). While this accounting method would only cover scope 1 and 2 emissions, it would be relatively simple to implement in a global policy toolkit.

Thirdly, coalition countries must introduce a coordinated set of carbon taxes on “dirty luxuries”, i.e. emissions-intensive goods and services that are unaffordable to most people (Haneman 2024). These could include mega-houses, superyachts, private jets, high-end road vehicles and

space tourism (see Lynch et al. 2019; Barros and Wilk 2021; Gössling and Humpe 2023). Such taxes would ensure that centimillionaires are held accountable for their recent consumption-related emissions, in line with the interest-qualified contributor pays principle. This is because dirty luxuries are the world's biggest source of superfluous emissions per unit. The rate of these taxes is not discussed here because it depends on the trade-off between the emissions one wants to cut and the emissions one wants to be paid for. There are two main ways to tax dirty luxuries. One option is for coalition countries to compile a list of such items and set minimum taxes on them. These taxes could be applied at the point of production or sale, or as an annual stamp duty (Wallace and Welton 2024; Haneman 2024). Alternatively, coalition countries could set an annual emissions ceiling, with emissions below the ceiling not being taxed, and those above it being taxed at a high rate. For example, the ceiling could be set at around 75 tCO_{2e} per year, which is equivalent to the average annual consumption emissions of the top 1% of the world's population by income (Oxfam 2023b: 15), and the luxury carbon tax rate could be set at 1 million USD per tonne.[4] The main advantage of the first option is that there is no need to calculate the carbon footprint of everyone worldwide by collecting data on household meters, building construction records, train and air travel, and so on, and exchanging this information between countries. For this reason, I submit that the taxation of dirty luxuries should be favoured over emissions ceilings as an RPICF tool.

One limitation of the RPICF proposal is that, no matter where the line between the ultra-rich and everyone else is drawn, there is an incentive for those just above it to position themselves immediately below, either by reducing their wealth or using more or less legal tricks to hide it. This constitutes a pragmatic argument against the RPICF proposal, which must be weighed against the normative arguments in its favour outlined in this article. However, it is important to note that this risk is mitigated to some extent by the RPICF toolbox, compared with different implementation proposals that rely solely on wealth taxation (Zucman 2024). In fact, even if a centimillionaire managed to stop qualifying as one and thus avoid both the minimum global wealth and minimum global carbon taxes on financial assets, they would still incur global carbon taxes on their luxury consumption. The latter apply to goods and/or services independently of the consumer.

Conclusions

The article raised two main points. Firstly, it argued that the RPICF proposal, which claims that the ultra-rich should bear the majority of the costs of international climate finance, is supported by at least one reasonable view of climate justice — the hybrid shift model — rather than being based solely on a broader conception of justice in taxation that does not take into account the problem of harm infliction implicit in climate change. This is the case if we qualify the contributor pays principle based on the moral weight of the interests at stake in both emissions and emissions financing, and if we adopt both an objective currency and a broad view of equal sacrifice. Secondly, the article outlined a global policy toolbox to enable the implementation of the RPICF proposal in a manner compatible with the hybrid shift model. This includes a minimum global wealth tax on centimillionaires, a minimum asset-based carbon tax on their financial assets, and a set of carbon taxes on 'dirty luxuries'.

[4] The emissions ceiling could also form part of a broader scheme of progressive carbon taxation. For a discussion of the normative arguments in favour of such a scheme, as well as the most relevant practical aspects, see Dietsch (2024).

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References

Alayza N, Larsen G and Waskow D (2024) What Could the New Climate Finance Goal Look Like? 7 Elements Under Negotiation. World Resources Institute, May 29. https://www.wri.org/insights/ncqg-key-elements

Arneson RJ (1999) Human Flourishing Versus Desire Satisfaction. Social Philosophy and Policy 16 (1): 113–42. https://doi.org/10.1017/S0265052500002272

Axelsen DV and Nielsen L (2024) The expressive injustice of being rich. Politics, Philosophy & Economics 24 (4): 291-312 https://doi.org/10.1177/1470594X241292371

Baatz C (2013) Responsibility for the Past? Some Thoughts on Compensating Those Vulnerable to Climate Change in Developing Countries. Ethics, Policy & Environment 16 (1): 94-110. https://doi.org/10.1080/21550085.2013.768397

Baatz C (2018) Climate Adaptation Finance and Justice. A Criteria-Based Assessment of Policy Instruments. Analyse & Kritik 40 (1):73-106. https://doi.org/10.1515/auk-2018-0004

Barros B and Wilk R (2021) The outsized carbon footprints of the super-rich. Sustainability: Science, Practice and Policy 17(1): 316–322. https://doi.org/10.1080/15487733.2021.1949847

Bernstein J (2025) You can't have your steak and call for political action on climate change, too. Journal of Value Inquiry 59: 497–517 (2025). https://doi.org/10.1007/s10790-023-09953-6

Blanchard O, Gollier C and Tirole J (2023) The Portfolio of Economic Policies Needed to Fight Climate Change. Annual Review of Economics 15: 689-722. https://doi.org/10.1146/annurev-economics-051520-015113

Bourban M (2023). Mitigation Duties. In: Pellegrino G and Di Paola M (eds) Handbook of the Philosophy of Climate Change. Cham, CH: Springer, pp. 721-758. https://doi.org/10.1007/978-3-031-07002-0_52

Brand DR (2016) Thomas Piketty's Global Tax on Wealth. Perspectives on Political Science 46 (1): 2–10. https://doi.org/10.1080/10457097.2016.1203228

Browne KE (2022) Rethinking governance in international climate finance: Structural change and alternative approaches. WIREs Climate Change 13 (5): e795. https://doi.org/10.1002/wcc.795

Caney, Simon (2010a). In: Humphreys S (ed) Climate Change, Human Rights and Moral Thresholds. Cambridge: Cambridge University Press, pp. 69-90.

Caney S (2010b) Climate change and the duties of the advantaged. Critical Review of International Social and Political Philosophy 13 (1): 203-228. https://doi.org/10.1080/13698230903326331

Carbon Tracker (2022) Oil and gas companies invest in production that will tip world towards climate catastrophe. December 8. https://carbontracker.org/oil-and-gas-companies-invest-in-production-that-will-tip-world-towards-climate-catastrophe/

Chakraborty S. (2025). The Distribution of Climate Finance among Annex-II Countries: A CBDR-RC Approach for Partial Funding of the Developing Countries. PERI Working Paper Series No. 615. https://peri.umass.edu/publication/the-distribution-of-climate-finance-among-annex-ii-countries-a-cbdr-rc-approach-for-partial-funding-of-the-developing-countries/

Chancel L (2022) Global carbon inequality over 1990–2019. Nature Sustainability 5: 931–938. https://doi.org/10.1038/s41893-022-00955-z

Chancel L, Bothe P, Voituriez T (2024) The potential of wealth taxation to address the triple climate inequality crisis. Nature Climate Change 14: 5–7. https://doi.org/10.1038/s41558-023-01891-2

Climate Action Tracker (2024) Warming Projections Global Update – November 2024. https://climateactiontracker.org/documents/1277/CAT_2024-11-14_GlobalUpdate_COP29.pdf

Colenbrander S, Cao Y, Pettinotti L and Quevedo A (2021) A fair share of climate finance: apportioning responsibility for the $100 billion climate finance goal. ODI Working Paper, 6 September. https://odi.org/en/publications/a-fair-share-of-climate-finance-apportioning-responsibility-for-the-100-billion-climate-finance-goal/

Corvino F, Pellegrini-Masini G, Pirni A, and Maran S. (2021). Compensation for Energy Infrastructures: Can a Capability Approach be More Equitable? Journal of Human Development and Capabilities 22(2): 197–217. https://doi.org/10.1080/19452829.2021.1887106

Dellink R, den Elzen M, Aiking H, Bergsma E, Berkhout F, Dekker T, and Gupta J (2009). Sharing the burden of financing adaptation to climate change. Global Environmental Change 19 (4): 411-421. https://doi.org/10.1016/j.gloenvcha.2009.07.009

Dietsch P (2024). A fairer and more effective carbon tax. Nature Sustainability. https://doi.org/10.1038/s41893-024-01429-0

Duus-Otterström G (2024a). Climate Change, Historical Emissions, and Unjust Benefits: A Comment on Axel Gosseries' Account of Climate Justice. Journal of Practical Ethics 12(1): 6-15. https://doi.org/10.3998/jpe.6268

Duus-Otterström G (2024b). Emissions Sufficientarianism. British Journal of Political Science 54 (2): 281–94. https://doi.org/10.1017/S0007123423000625

Fahlquist JN (2009) Moral Responsibility for Environmental Problems—Individual or Institutional?. Journal of Agricultural and Environmental Ethics 22: 109–124. https://doi.org/10.1007/s10806-008-9134-5

Farbstein E, Vallinder A and Buchmann L (2025) Carbon accounting empowers your business to achieve net zero emissions & comply with reporting legislation. Normative, 19 March. https://normative.io/insight/carbon-accounting-explained/

Fragnière A (2018) How Demanding is Our Climate Duty? An Application of the No-Harm Principle to Individual Emissions. Environmental Values 27(6): 645-663. https://doi.org/10.3197/096327118X15343388356365

Francis, B (2025). Between Luxury and Subsistence: An Ethics of Middle Emissions. Ethics, Policy & Environment, online first: 1–22. https://doi.org/10.1080/21550085.2025.2508125

Fruh K and Hedahl M (2013) Coping with Climate Change: What Justice Demands of Surfers, Mormons, and the Rest of us. Ethics, Policy & Environment 16:3: 273-296. https://doi.org/10.1080/21550085.2013.843378

Frumhoff PC, Heede R and Oreskes N (2015) The climate responsibilities of industrial carbon producers. Climatic Change 132: 157–171. https://doi.org/10.1007/s10584-015-1472-5

Gajevic Sayegh A (2019) Climate finance: Moral theory and political practice. In Routledge Handbook of Climate Justice, edited by T. Jafry, M. Mikulewicz M., and K. Helwig, pp. 153-164. Routledge.

Gardiner SM (2016) In defence of climate ethics. In Gardiner SM and Weisbach DA, Debating climate ethics. Oxford and New York: Oxford University Press, pp. 3-133.

Gardiner SM (2017) Climate Ethics in a Dark and Dangerous Time. Ethics 127 (2): 430-465. https://doi.org/10.1086/688746

Gordon NJ (2023) Climate Finance: An Overview. Environment: Science and Policy for Sustainable Development 65(4): 18-26. https://doi.org/10.1080/00139157.2023.2205347

Gosseries, A (2023) What is intergenerational justice?. Cambridge: Polity Press.

Gössling S and Humpe A (2023) Millionaire spending incompatible with 1.5 °C ambitions. Cleaner Production Letters 4: 100027. https://doi.org/10.1016/j.clpl.2022.100027

Grasso M (2009) An ethical approach to climate adaptation finance. Global Environmental Change 20(1): 74-81. https://doi.org/10.1016/j.gloenvcha.2009.10.006

Halliday D (2013) Justice and Taxation. Philosophy Compass 8: 1111-1122. https://doi.org/10.1111/phc3.12092

Haneman VJ (2024) Taxing Dirty Luxuries. Case Western Reserve Journal of International Law 56(1): 197-22. https://scholarlycommons.law.case.edu/jil/vol56/iss1/11

Harvey F (2024) 'Morally, nobody's against it': Brazil's radical plan to tax global super-rich to tackle climate crisis. The Guardian, 28 July. Availabe at: https://www.theguardian.com/world/article/2024/jul/28/brazil-radical-plan-tax-global-super-rich-tackle-climate-crisis

Henley & Partners (2024) The Centi-Millionaire Report 2024. Available at: https://www.henleyglobal.com/publications/centi-millionaire-report-2024

Heyward C (2021) Is the beneficiary pays principle essential in climate justice? Norsk Filosofisk Tidsskrift 56(2-3): 125–136. https://doi.org/10.18261/issn.1504-2901-2021-02-03-07

Hormio S (2024). Taking Responsibility for Climate Change. Cham (CH): Palgrave Macmillan.

Höltge, J, Cowden, RG, Lee, M T, et al. (2022). A systems perspective on human flourishing: Exploring cross-country similarities and differences of a multisystemic flourishing network. The Journal of Positive Psychology 18(5): 695–710. https://doi.org/10.1080/17439760.2022.2093784

Hourani D, Millar-Powell B, Perret S, and Ramm A (2023). The taxation of labour vs. capital income: A focus on high earners. OECD Taxation Working Papers No. 65, OECD Publishing, Paris. https://doi.org/10.1787/04f8d936-en

Independent High-Level Expert Group on Climate Finance (2022). Finance for climate action: Scaling up investment for climate and development – Summary. November. Available At : https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2022/11/IHLEG-Finance-for-Climate-Action-1.pdf

Independent High-Level Expert Group on Climate Finance (2024). Raising ambition and accelerating delivery of climate finance. November. Available at: https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2024/11/Raising-ambition-and-accelerating-delivery-of-climate-finance_Third-IHLEG-report.pdf

Ives N and Hall D (2024) COP29: who pays for climate action in developing nations – and how much – becomes more urgent. The Conversation, 11 November. https://theconversation.com/cop29-who-pays-for-climate-action-in-developing-nations-and-how-much-becomes-more-urgent-242678

Jaarte M (2024) Capital flight and domination by diffuse collectives. Politics, Philosophy & Economics 24 (4): 334-354. https://doi.org/10.1177/1470594X241292374

Kenner D (2019). Carbon Inequality: The Role of the Richest in Climate Change. London: Routledge.

Kilcullen J (1981) Mill on duty and liberty. Australasian Journal of Philosophy 59(3): 290–300. https://doi.org/10.1080/00048408112340251

Kingston, Ewan (2014). Climate Justice and Temporally Remote Emissions. Social Theory and Practice 40(2):281-303. https://doi.org/10.5840/soctheorpract201440217

Kyllönen S (2018), Climate Change, No-Harm Principle, and Moral Responsibility of Individual Emitters. Journal of Applied Philosophy 35(4): 737-758. https://doi.org/10.1111/japp.12253

Listokin, Y. (2011). Taxation and Liquidity. Yale Law Journal 1682 120(7): 2682-1733. https://heinonline.org/HOL/Page?handle=hein.journals/ylr120&id=1690

Loutzenhiser G, and Mann E. (2021). Liquidity issues: solutions for the asset rich, cash poor. Fiscal Studies 42: 651–675. https://doi.org/10.1111/1475-5890.12281

Lynch MJ., Long MA, Stretesky PB and Barrett KL (2019). Measuring the Ecological Impact of the Wealthy: Excessive Consumption, Ecological Disorganization, Green Crime, and Justice. Social Currents 6(4): 377-395. https://doi.org/10.1177/2329496519847491

Mager F (2025). Reclaiming tax sovereignty to transform global climate finance. Tax Justice Network, June 16. https://taxjustice.net/2025/06/16/reclaiming-tax-sovereignty-to-transform-global-climate-finance/

Meyer LH and Roser D (2010) Climate justice and historical emissions. Critical Review of International Social and Political Philosophy 13(1): 229–253. https://doi.org/10.1080/13698230903326349

Michaelowa A (2022) A vision for international climate finance after 2025. In Michaelowa and Sacherer A-K (eds) Handbook of International Climate Finance. Cheltenham, UK – Northampton, MA, USA: Edward Elgar, pp. 476-486.

Michaelowa A and Sacherer A-K (2022) Introduction to the Handbook of International Climate Finance: is climate finance a meteoric fashion or a stable pillar of the global response to anthropogenic climate change?. In Michaelowa and Sacherer A-K (eds) Handbook of International Climate Finance. Cheltenham, UK – Northampton, MA, USA: Edward Elgar, pp. 1-15.

Miller D (2007) National Responsibility and Global Justice. Oxford & New York: Oxford University Press.

Milman O and Lakhani N (2024) Revealed: wealthy western countries lead in global oil and gas expansion. The Guardian, 24 July. https://www.theguardian.com/environment/article/2024/jul/24/new-oil-gas-emission-data-us-uk

Moellendorf D (2002) Mobilizing Hope: Climate Change and Global Poverty. Oxford and New York: Oxford University Press.

Murphy LB and Nagel T (2002) The Myth of Ownership: Taxes and Justice. Oxford and New York: Oxford University Press.

Neves JPB, and Semmler W (2021). A Proposal for a Carbon Wealth Tax: Modelling, Empirics, and Policy (May 19, 2022). Available at SSRN. http://dx.doi.org/10.2139/ssrn.4114243

OECD (2024). Climate Finance Provided and Mobilised by Developed Countries in 2013-2022. https://www.oecd.org/en/publications/climate-finance-provided-and-mobilised-by-developed-countries-in-2013-2022_19150727-en.html

Oxfam (2023a). Climate Finance Shadow Report 2023: Assessing the delivery of the $100 billion commitment. https://policy-practice.oxfam.org/resources/climate-finance-shadow-report-2023-621500/

Oxfam (2023b). Survival of the Richest, January 16. https://www.oxfam.org/en/research/survival-richest

Oxfam (2022). Carbon Billionaires: The investment emissions of the world's richest people. & November. Available at: https://policy-practice.oxfam.org/resources/carbon-billionaires-the-investment-emissions-of-the-worlds-richest-people-621446/

Oxfam (2025) Takers not Makers: The unjust poverty and unearned wealth of colonialism. 20 January. Available at: https://www.oxfam.org/en/research/takers-not-makers-unjust-poverty-and-unearned-wealth-colonialism

Page EA (2008) Distributing the burdens of climate change. Environmental Politics 17(4): 556-575. http://dx.doi.org/10.1080/09644010802193419

Patel A (2024) Interview: China's position on 'international climate finance' ahead of COP29. Carbon Brief, 30 May. Available at: https://www.carbonbrief.org/interview-chinas-position-on-international-climate-finance-ahead-of-cop29/

Pauw WP, Moslener U, Zamarioli LH, Amerasinghe N, Atela J, Affana JPB, Buchner B , Klein RJT, Mbeva KL, Purim J, Roberts JT, Shawoo Z, Watson C, Weikmans R (2022) Post-2025 climate finance target: how much more and how much better? Climate Policy 22 (9–10): 1241–1251. https://doi.org/10.1080/14693062.2022.2114985Prakash P (2024 June 4). The world's wealthy need to pay to address the climate crisis, says key expert behind the Paris Agreement. Fortune. https://fortune.com/europe/2024/06/04/world-wealthy-rich-pay-tax-climate-crisis-top-expert-paris-agreement-laurence-tubiana/

Piketty T (2014) Capital in the Twenty-First Century. Cambridge (MA): Belknap Press: An Imprint of Harvard University Press.

Ritchie H, Roser M and Rosado P (2024) Renewable Energy. OurWorldinData.org. https://ourworldindata.org/renewable-energy (accessed 28 May 2025)

Robeyns, I. (2022). Why Limitarianism?*. Journal of Political Philosophy 30: 249-270. https://doi.org/10.1111/jopp.12275

Robeyns, I. (2019). What, if Anything, is Wrong with Extreme Wealth? Journal of Human Development and Capabilities 20(3): 251–266. https://doi.org/10.1080/19452829.2019.1633734

Saez E and Zucman G (2019) The Triumph of Injustice: How the Rich Dodge Taxes and How to Make Them Pay. New York: W. W. Norton & Company

Shishlov I and Censkowsky P (2022) Definitions and accounting of climate finance: between divergence and constructive ambiguity. Climate Policy 22 (6): 798–816. https://doi.org/10.1080/14693062.2022.2080634

Shue H (2014) Climate Justice: Vulnerability and Protection. Oxford & New York: Oxford University Press.

Shue H (2015) Historical Responsibility, Harm Prohibition, and Preservation Requirement: Core Practical Convergence on Climate Change. Moral Philosophy and Politics 2 (1): 7-31. https://doi.org/10.1515/mopp-2013-0009

Shue H (2017) Responsible for what? Carbon producer CO2 contributions and the energy transition. Climatic Change 144: 591–596 (2017). https://doi.org/10.1007/s10584-017-2042-9

Starr J, Nicolson C, Ash M, Markowitz EM, and Moran D (2023) Income-based U.S. household carbon footprints (1990–2019) offer new insights on emissions inequality and climate finance. PLOS Climate 2 (8): e0000190. https://doi.org/10.1371/journal.pclm.0000190

Tan K-C (2023) Climate reparations: Why the polluter pays principle is neither unfair nor unreasonable. WIREs Climate Change 14 (4): e827. https://doi.org/10.1002/wcc.827

Timmer, D. (2021), Limitarianism: Pattern, Principle, or Presumption?. Journal of Applied Philosophy 38: 760-773. https://doi.org/10.1111/japp.12502

Truccone S (2024) The Temporal Dimension of Justice: From Post-Colonial Injustices to Climate Reparations. Berlin & Boston: De Gruyter.

Tubiana L (2024) Taxing Polluters Is the Key to Climate Justice. Project Syndicate, 9 April. https://www.project-syndicate.org/commentary/tax-fossil-fuels-pollution-wealth-revenues-for-climate-change-just-transition-by-laurence-tubiana-2024-04

UNFCCC (1992). The Rio Declaration. https://unfccc.int/sites/default/files/convention_text_with_annexes_english_for_posting.pdf

UNFCCC (2009). Copenhagen Accord. https://unfccc.int/resource/docs/2009/cop15/eng/l07.pdf

UNFCCC (2015). The Paris Agreement. https://unfccc.int/sites/default/files/resource/parisagreement_publication.pdf

UNFCCC (2021). Glasgow Climate Pact. https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf

UNFCCC (2024). Decision -/CMA.6 - New collective quantified goal on climate finance. https://unfccc.int/sites/default/files/resource/CMA_11%28a%29_NCQG.pdf

Vanderheiden S (2015) Justice and Climate Finance: Differentiating Responsibility in the Green Climate Fund. The International Spectator 50(1): 31–45. https://doi.org/10.1080/03932729.2015.985523

VanderWeele TJ. (2017) On the promotion of human flourishing. PNAS 114 (31): 8148–56. https://doi.org/10.1073/pnas.1702996114

von Allmen K (2022) Reducing Climate Change Harms: How to Make Remedial Responsibilities Applicable. Public Affairs Quarterly 36 (4): 325–352. https://doi.org/10.5406/21520542.36.4.04

Wallace CG and Welton S (2024) Taxing Luxury Emissions. Cornell Law Review 109 (5): 1153-1232. https://www.cornelllawreview.org/2024/09/23/taxing-luxury-emissions/

World Inequality Lab (2022) World Inequality Report 2022. Available at: https://wir2022.wid.world/www-site/uploads/2023/03/D_FINAL_WIL_RIM_RAPPORT_2303.pdf (accessed 13 May 2025)

Zellentin A (2015) Compensation for Historical Emissions and Excusable Ignorance. Journal of Applied Philosophy 32 (3): 258-274. https://doi.org/10.1111/japp.12092

Zou QC, Alayza N, Higgins H and Larsen G (2024) Which Countries Should Pay for International Climate Finance? World Resources Institute, 7 November. https://www.wri.org/insights/china-climate-finance-developing-countries

Zucman G (2024) A blueprint for a coordinated minimum effective taxation standard for ultra-high-net-worth individuals. EU Tax Observatory, 25 June. https://www.taxobservatory.eu//www-site/uploads/2024/06/report-g20.pdf