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Climate Justice from Theory to Practice: The Responsibility and Duties of the Oil Industry

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This is an excerpt from *Global Climate Justice: Theory and Practice*. You can download the book free of charge from E-International Relations.

Thirty percent of the global industrial greenhouse gas emissions between 1965–2018 can be traced to the activities of 15 companies in the oil industry. Based on this evidence and on a number of morally relevant facts, this chapter proposes a normative framework for establishing the positive responsibility that oil companies have in relation to climate change. Then, the analysis articulates this responsibility in the form of two duties: a duty of reparation and a duty of decarbonisation. The duty of reparation implies rectification through disgorgement of funds for the wrongful actions of oil companies, which resulted in negative climate impacts, starting from the most vulnerable groups affected by climate change. The duty of decarbonisation entails a large-scale transformation that oil companies ought to undergo in order to reduce and eventually eliminate carbon emissions from their business model. Finally, the chapter indicates possible practical implications of these duties.

Introduction

Climate change is essentially a matter of justice. Philosophers and other scholars, as well as politicians, activists, religious leaders and many others have long highlighted and explored the numerous ethical considerations and challenges that are inseparable from discussions of the causes, consequences and potential human responses to anthropogenic climate change (Grasso and Markowitz 2015). A prominent and long-lasting concern of climate justice is the question of 'who counts' – that is, which agents (individuals and/or groups) should be at the centre of moral debates about climate change.

Beyond the current state-centric perspective of the international system, which considers states the primary agents of climate justice, there is a spirited debate about other possible agents. For example, some environmentalist rhetoric focuses on the role of individuals, both in terms of reducing ones' own emissions and for advocating for large-scale change. Although this perspective has gained attention in recent years, it should be complemented by forms of collective responsibility that do not exclude individual responsibility, but which rather integrate the two perspectives, paying particular attention to novel or neglected collective agents of justice.

Among these, given their unique and distinctive role, responsibility and duties in the context of climate change, oil and gas companies – for sake of simplicity hereafter referred to also as 'oil companies' or the 'oil industry' – are possibly the most significant overlooked group of agents. The oil industry, through the emissions generated by the fossil fuels it processes, has significantly increased atmospheric concentrations of greenhouse gases (GHG) (IEA 2021). Therefore, this industry has contributed directly to anthropogenic climate change.

It is worth stressing that this argument does not imply that the oil industry should become the only agent responsible for addressing climate change, or even that oil companies are the most important players. Consumers, civil society, businesses and other stakeholders all play a role in causing climate change and have consequent responsibilities in addressing climate change. The goal of the chapter is to draw attention to oil companies' responsibility for causing

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climate change, the duties this responsibility creates and the consequent implications for climate justice.

Oil companies should play their part in global climate governance, along with states, individuals and other agents. That part is significant, since they have played a crucial role in causing, shaping, advancing and defending the current, unsustainable fossil fuel-dependent global economy. By continuing to produce fossil fuels and feed consumer demand, they have been dictating the rules of the game to the global economic system. Based on these considerations, this chapter first outlines the direct contribution the oil industry has made to climate change in terms of its cumulative emissions and their impacts. Then, after specifying the unique agency of oil companies, the chapter argues that their activities have violated the negative responsibility of 'doing no harm'. Therefore, these companies have a positive moral responsibility in the context of climate change to 'clean up the mess' they caused. Subsequently, the chapter articulates oil companies' positive responsibility in the form of two duties, which include different actions to rectify the harm done: a duty of reparation and a duty of decarbonisation. The duty of reparation encapsulates the requirement that oil companies rectify the injustices resulting from the harm the industry has generated, while the duty of decarbonisation entails an obligation by the industry to eliminate carbon emissions from their activities to prevent future harm. Finally, the chapter briefly indicates some possible practical implications of the duties of reparation and decarbonisation.

1. The Oil Industry's Direct Contribution to Climate Change

Recent studies by Richard Heede and colleagues focus on the contributions of large carbon producers to global GHG emissions (Heede 2014; Frumhoff et al. 2015; Heede and Oreskes 2016). 'Carbon majors', as these studies term large carbon businesses, are the world's largest public and private investor-owned, state-owned and government-run oil, gas, coal and cement producers. The primary finding of Heede and colleagues is that just 100 currently operating carbon majors have produced 71% of global industrial emissions since 1988 (according to Heede's figures, the top emitters and the large majority of producers are fossil fuel corporations, whereas cement producers are a small minority among carbon majors; the original 2014 database, for instance, included only 7 cement producers whose emissions amounted to 1.45% of carbon majors' cumulative total, see Heede 2013, table 4, 17). Further ground-breaking work in attribution science – the burgeoning science of attributing weather events to specific emitters and of assessing loss and damage associated with climate impacts – has made it possible to trace specific harm-generating climate impacts to carbon majors. Ekwurzel et al. (2017) showed that carbon majors' fossil fuel-related activities substantially contributed to relevant climate impacts, namely increased global mean surface temperature (GMST) and increased global sea level (GSL). For instance, the emissions of just 90 major carbon producers are responsible for

~29–35% of the rise in GMST and ~11–14% of the rise in GSL since 1980; three of them – BP, Chevron and ExxonMobil – have caused more than 6% of the rise in GSL. By the same token, Licker et al. (2019) demonstrate that 88 of the carbon majors were responsible for 55% of observed ocean acidification 1880–2015, with as yet inestimable damage to ecosystems and marine life, not to mention the fishing industry so vital to myriad coastal communities.

Oil companies are the largest and most numerous carbon majors. Generally, oil and gas are owned by states, or, in weak and failed states, by the subjects who exert irregular coercive control over them (Wenar 2015). Yet the oil industry is the conveyor that moves oil and gas from below the ground, irrespective of its ownership and localisation, and into the global economy. This industry comprises international oil companies (IOCs) and national oil companies (NOCs) – this analysis excludes two other typologies of oil and gas companies, given their irrelevance in terms of global GHG emissions, the

so-called 'independents' (smaller companies that operate only in the upstream segment of the oil industry's operations) and 'oilfield service companies' that provide services and outsourcing needs to the oil industry. IOCs are private entities whose business operations traditionally cover the full cycle from exploration, through production and refinement, to distribution of petroleum products. NOCs are largely similarly structured, being either fully or majority-owned by a national government. The activities of the oil industry are divided into upstream operations of exploration and production, and downstream operations of refining and distribution. Given the high entry costs, the world's

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largest oil companies are typically highly vertically integrated, i.e., they carry out both upstream and downstream activities. Exploration includes prospecting, seismic and drilling activities that take place before the development of a proper oil field; production involves the extraction of oil from below the ground through onshore and offshore drilling; refining concerns the separation of unwanted components in order to obtain clean hydrocarbons marketable into different usable products; and finally, in the distribution phase, such products are transferred to consumers through pipeline networks, tankers, railway tanks and trucks.

The oil industry's contribution to cumulative emissions of GHGs is impressive. Between 1965–2018, only 10 oil and gas companies have accounted for almost 25% of all emissions and only 15 have accounted for almost 30%, as shown in Table 12.1. Additionally, the oil industry holds fossil fuel reserves that, if burned, would increase the earth's average surface temperature well above 1.5°C above pre-industrial levels. Welsby et al. (2021) claim that by 2050 nearly 60% of oil and gas and 90% of coal reserves should remain unburned in order to meet the 1.5°C target.

2. The Unique Agency of Oil Companies

Since the dawn of climate policy, states have been the primary, 'direct' agents involved in addressing climate change. Other stakeholders, such as civil society, private-sector actors, local authorities and communities, international institutions and individuals were mostly considered secondary, 'indirect' agents. In the last decade, however, the lines between actors have been blurring, paving the way for a new framework of hybrid multilateralism – an 'intensified interplay between state and non-state actors in the new landscape of international climate cooperation' (Backstrand et al. 2017, 562).

There is an agreement that all stakeholders share common but differentiated responsibilities in the context of climate change, as stated by the United Nations Framework Convention on Climate Change (UNFCCC 1992). This means that all stakeholders must do their part – proportional to their contribution in terms of emissions and their capacity to combat climate change. Relative to their prominence and contribution to the problem, the oil industry appears to be truly neglected in the current global climate discourse. Oil companies have contributed greatly to causing climate change and have perpetuated the climate crisis by supporting the status quo. They are causing, shaping, advancing and defending the current, unsustainable fossil fuel- dependent global economy. Through their informed and self-advantageous choice to continue the exploration, production, refinement and distribution of fossil fuels after the risks of doing so became public, carbon majors have essentially imposed on the global socio-economic system a carbon-intensive model of development. Rather than engaging in a large-scale search for alternatives and phasing out fossil fuels, as warranted by the urgency of the climate crisis, oil companies have continued their fossil fuel-dependent business models for decades. In light of this, it is morally unacceptable to equate oil companies' position and responsibility to those of other stakeholders or to those of the private sector in general. Global climate governance should reflect the unique agency of the oil industry, as it has played a very particular and significant role in causing the climate crisis and should contribute to addressing it accordingly.

In fact, oil companies currently have no special responsibilities or duties in global climate governance, despite their substantial contribution to the problem, the wealth and benefits they have obtained through fossil fuel- related activities and their political influence and technical expertise that would have granted them a relatively smooth transition to less carbon- intensive products (Frumhoff et al. 2015; CIEL 2017). As with other corporate agents, oil companies are only subject to the binding emissions limits imposed by national and sub-national political authorities. At best, similar to other corporations, oil companies assume voluntary obligations to disclose their carbon emissions and integrate abatement strategies into their business models. Given the nature of their core business, though, this is not enough.

To be clear, oil companies have a truly unique role in the current global socio- economic system: these companies have been dictating the rules of the game to other businesses in terms of their reliance on fossil fuels. Through their informed choice to continue the extraction, refinement and distribution of fossil fuels in the 1990s, oil companies have perpetuated the dependency of other industries on their products – industries that had to shape their business models around fossil fuels. Therefore, oil companies should have more stringent responsibilities than other industries in combatting climate change. Other industries that depend on supply from oil companies should be attributed fossil

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fuel-related duties only after the rule-of-the-game shapers (i.e., oil companies) have met theirs. Identifying oil companies as a stand-alone group, with very precise and unique responsibilities, is crucial to advancing efforts to combat climate change.

Given the scientific knowledge and consensus about climate change, fossil fuels may be considered a harmful product, the use of which affects the health, lives and well-being of present and future generations of humans and non-humans. Attribution science goes even further in trying to identify and ascribe climate impacts to specific sources; a source could be a particular agent (e.g., an oil company), a sector or an activity (Burger et al. 2020). Hence, source attribution would make it possible to identify a specific amount of anthropogenic climate harm that was caused by individual oil companies. This attribution is based on the proportional contribution of the company's fossil fuels to changes in the chemical composition of the atmosphere, the extrapolation of the proportional contribution to localised events and the identification of actual harms caused by those impacts (Burger and Wenz 2018). In other words, it seems that a sound causal chain linking anthropogenic climate change to harm and the consequent monetary costs and then to emitters – oil companies, for instance – is now possible.

Cases in which the harmfulness of a product was confirmed by scientific evidence have occurred in the past and reshaped whole industries. Like companies previously working with tobacco, asbestos or lead-based paint, oil companies should assume some responsibility for their involvement in producing a harmful product and for the harm produced.

Not all oil companies operate in wealthy states, which indicates the complex structure of the current global socio-economic system. According to Heede (2014), substantial emissions have originated in somewhat less-developed countries, such as Brazil, China, India, Iran, Mexico, Saudi Arabia and South Africa. Recognising oil companies as important players in global climate change and holding them responsible for their fossil fuel-related activities would, among other things, help bridge a simplistic divide between 'the rich' and 'the poor' worlds. It could lead also to a fairer distribution of the burden of fighting climate change among state and non-state actors around the world.

Introducing oil companies as moral agents in the context of climate change opens up a new avenue for normative inquiries in climate ethics, which may have major implications for global climate governance. For example, an alternative mode of assigning responsibility to different agents in the global system could alter approaches to rectification for harm and the related distribution of burdens and benefits, influence the patterns of well-being among agents and change the flows of financial and other resources between peoples and generations.

Recognition of the prominent role of oil companies in causing and perpetuating climate change does not mean that they should become the only or primary subjects of climate justice. States, consumers, civil society, businesses and other stakeholders all have responsibilities to do their fair share in resolving climate change. Crucially, states are the main agents responsible for providing appropriate legislative and political frameworks for ensuring that carbon majors act based on their duties. And indeed, consumers have responsibility too. However, there are ethical questions about how much responsibility they actually have for the harm caused by their emissions, which are, in the grand scheme of things, minuscule. According to the International Energy Agency (2021) individual behavioural changes would only account for about 4% of the reductions in GHGs needed to achieve a net-zero target by 2050. Additionally, there are positive moral questions regarding individual responsibility, given the political and economic constraints on action as well as the oil industry's entrenched mindset of deflecting blame by framing the question of climate change as one of individual, consumption-based responsibility and thus preventing the general public from understanding the climate crisis as a structural problem largely driven by the oil industry's denial, misinformation, lobbying and disablement of climate policy.

At any rate, this chapter does not intend to obscure the role of other stakeholders. Rather, the goal is to draw attention to a significant and utterly neglected group of agents, whose unique and distinctive role and responsibility in causing climate change should be translated into much-needed policies to support current climate efforts. Oil companies should play their part in global climate governance, which is adequate and appropriate to their role in causing climate change, along with states, individuals and other agents.

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3. Oil Companies' Responsibility

One of the clearest and strongest imperatives of all forms of morality is the 'no-harm' principle (Shue 2015; Mayer 2016). This principle states that agents have a negative responsibility to refrain from acting in certain ways to prevent and/or avoid causing harm to others. The moral imperative to do no harm is central to mainstream notions of justice, and it has shaped and guided societies for generations. Considering empirical evidence of the harm that comes from oil companies' activities, these entities are clearly in violation of their negative responsibility to do no harm. In light of this, it is a societal judgement to individuate the most appropriate forms of positive responsibility as shaped by morally relevant facts associated with the violation of the no-harm principle.

The concept of responsibility raises serious concerns in relation to climate change that should be addressed pluralistically (Caney 2010; Jamieson 2010; Jamieson 2015) and requires a contextual investigation in order to ground and develop duties applicable and appropriate to the oil industry. It is also worth noting that most authors use 'responsibility' and 'duty' interchangeably (e.g., Shue 2017). This chapter, however, distinguishes between the two concepts and adopts the view that responsibility is a condition that implies an ability to act at one's own will, whereas a duty involves a moral commitment that denotes an active willingness to do or not do something.

This analysis relies on a few conceptual distinctions related to the scope and objectives of the notions of responsibility (Miller 2008; Jamieson 2010; Jamieson 2015; Shue 2015). Responsibility can be 'negative' and require agents to refrain from action (as the responsibility that requires agents to do no harm) or 'positive' and require agents to act in specific ways (the kind of responsibility discussed in this chapter in relation to the actions required of oil companies). Additionally, responsibility can be 'special' and pertain only to some agents (the affected agents; here, the harmed agents) or 'general' and be owed to all humanity and possibly to the earth. Another distinction is between 'backward-looking' responsibility (that demands that agents act based on something that has occurred in the past) and 'forward-looking' responsibility (that implies that agents act because they are in the position to do something to improve the situation for the future). This chapter also distinguishes between 'causal' and 'moral' responsibility. Causal responsibility can be understood as 'causal contribution', while a more stringent notion of moral responsibility is based on the appraisal of agents' intentions and assesses their voluntariness, control and knowledge. These conceptual distinctions are important but should not be overstated since they are often blurred when applied to specific issues.

Oil companies' positive responsibility ought to be established in a pluralistic and non-arbitrary way to justify and outline their consequent duties. To this end, it is first necessary to point out the morally relevant facts related to oil companies' activity, which determine their positive responsibility and shape their consequent duties. Presenting the facts helps clarify the conduct of oil companies and the moral context within which they operate. The morally relevant facts listed below provide a normative foundation for oil companies' positive responsibility for causing climate change and the consequent duties they have for addressing the climate crisis (for the full specification of facts 2 through 6, see Grasso 2022, chapter 2):

- Fact 1: The largest 60 oil companies contributed to more than 40% of all global industrial emissions between 1988–2015 (Carbon Majors Database – 2017 Dataset Release). According to the 2018 Carbon Majors Database, just 10 oil and gas companies accounted for almost 25% of all global industrial emissions between and just 15 for almost 30% between 1965–2018.
- Fact 2: Some oil companies have had knowledge about the harmful effects of burning fossil fuels in causing climate change (CIEL 2017). For instance, at the celebration of the one-hundredth anniversary of the world's first commercial oil well in 1959, organised by the American Petroleum Institute in New York, the renowned physicist Edward Teller warned oil executives, government officials and scientists with startling prescience about the correlation between carbon dioxide and global warming.
- Fact 3: Most of Big Oil's emissions were released between 1988–2015 (Carbon Majors Database – CDP Carbon Majors Report 2017). Additionally, the five largest IOCs – BP, Chevron, ExxonMobil, Shell and TotalEnergies – plan to invest around \$3.5 billion (only 3 percent of their 2019 capital expenditures) in low-carbon technologies, while roughly \$110.5 billion will be put into oil and gas exploration and production (InfluenceMap 2019).

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- Fact 4: Big Oil had the possibility to reduce the harmful effects of its business and to adjust its business model to become less carbon-intensive; some investor-owned oil corporations had this opportunity over 40 years ago (CIEL 2017). At the end of the 1980s, the US oil industry owned or controlled the largest share of solar panel production in its homeland, maintaining its prominence in this technology well into the 2000s. If these technologies had been developed and deployed, the oil industry could have had a major impact on reducing carbon emissions and accelerating the shift toward a low-carbon future. But the prospects of the higher costs of carbon-saving technologies, at least initially, slashing the oil industry's profits meant that it chose to not go down this path.
- Fact 5: Leading investor-owned oil companies actively opposed and, in many cases, successfully prevented policies to reduce GHG emissions and, in some countries, funded climate denial efforts (Oreskes and Conway 2011; Frumhoff et al. 2015). The evidence of the oil industry's denial is overwhelming.
- Fact 6: oil companies have made substantial profits that have greatly increased the wealth of their shareholders through their activities related to fossil fuels (Frumhoff et al. 2015).

Fact 1 suggests that Big Oil has propelled climate change by exploring, producing, refining, distributing and burning fossil fuels. This fact establishes causal responsibility, which is a necessary but not sufficient condition for the more stringent notion of moral responsibility. Moral responsibility requires that agents are aware of the consequences of their actions, can form intentions about their actions and can carry them out (Miller 2004). Since at least since the first Intergovernmental Panel on Climate Change (IPCC) report in 1990,

Big Oil has known about the harmful consequences of its business model (Fact 2). Despite this knowledge, oil companies have released most of their emissions within the past three decades (Fact 3) when they were able to limit their harmful actions (Fact 4). In addition, some oil companies intentionally blocked initiatives to address climate change and funded climate denialism (Fact 5). And all oil companies have accumulated substantial wealth through their fossil fuel-related activities (Fact 6). This latter fact is not in itself morally wrong; however, it is still morally relevant since it strengthens and better clarifies oil companies' responsibilities and duties related to climate change. Fact 6 corresponds to a moral logic that distributes the burden of rectificatory actions in proportion to the benefits derived and also to the ability to pay.

In sum, these facts provide a justification for assigning oil companies moral responsibility for climate change (Grasso, 2020). In particular, it is possible to assign oil companies 'collective' moral responsibility. They are, in fact, conglomerate collectivities, whose 'identity is not exhausted by the conjunction of the identities of the persons in the organization' (French 1984, 13). Conglomerate collectivities have the following features: (a) an identity larger than the sum of the identities of their members; (b) decision-making structures that enable the inputs of members' judgements to be translated into collective judgements as outputs; (c) consistency over time; and (d) self-conception as a unit. Accordingly, oil companies are indeed conglomerate collectivities, which can qualify as moral agents and, therefore, can have different forms of responsibility.

Based on these morally relevant facts, and in line with the notion of moral responsibility of collective entities enunciated above, the oil industry must be held morally responsible for their contributions to causing climate change. Specifically, these facts justify assigning oil companies with positive, special, backward- and forward-looking moral responsibility for climate change.

4. Articulation of oil companies' duties of reparation and decarbonisation

Such a composite notion of oil companies' positive responsibility is a normative construct focused on their conduct and intentions in the context of the violation of the no-harm principle. It provides the moral basis for duties compelling oil companies to act in certain ways: the duties of reparation and of decarbonisation. These duties should be understood as informal 'sanctions' imposed by the moral nature of the oil industry's responsibility for climate change (Jamieson 2015) and are grounded in corrective justice which, originating from wrongful harm-doing, helps focus on the past and present harm caused by oil companies and elaborate on the resulting actions required to rectify injustices produced by such harm (Meyer and Roser 2010).

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The duties of reparation and decarbonisation resonate with the core claim of climate justice movements. These claims demand, by and large, that richer agents, including corporations, repay their climate debt, divided into an 'impacts debt' and an 'emissions debt'. The ultimate objectives of this request – which, to a large extent, are consistent with the UNFCCC's core ethical ambitions – are to take democratic control over the economy, govern climate change in a participatory way and lessen the injustices involved. The impacts debt – embodied by the duty of reparation – implies, by and large, a rectification of the harm brought about by climate change, while the emissions debt – inscribable in the duty of decarbonisation – requires action to reduce carbon emissions and associated future harms, possibly in conjunction with some form of historical contribution to the problem as demanded, for instance, by the Lofoten Declaration.

To articulate the corrective justice perspective in relation to oil companies' duties of reparation and of decarbonisation, it is necessary to identify:

1. The duty-bearers (i.e., the agents who should bear the financial and other burdens of rectificatory actions);
2. The moral basis of the injustice (i.e., the moral principles that justify and define rectificatory actions);
3. The structure of the duties imposed on oil companies and the forms that rectificatory actions should take (i.e., the concrete means through which rectification of harm done should be carried out); and,
4. The duty-recipients (i.e., the subjects entitled to rectification and the modality of the allocation of the rectificatory actions among them envisaged by the duties).

The rest of this section addresses point (ii) since it is common to both duties of reparation and decarbonisation. The following section addresses points (iii) and (iv) in relation to each of the two duties individuated. A thorough answer to point (i) is pleonastic, since this analysis obviously considers oil companies as duty-bearers and, more broadly, as moral agents.

The moral basis of the injustice

Point (ii) concerns the moral principles that justify the rectificatory actions included in the duties imposed on oil companies by their positive moral responsibility. The climate ethics literature (e.g., Caney 2005; Shue 2015) usually refers to two backward-looking principles – the 'polluter pays principle' (PPP) and the 'beneficiary pays principle' (BPP) – and one forward-looking principle – the 'ability to pay principle' (APP). The PPP distributes the financial and other burdens associated with rectificatory actions in proportion to past contributions agents have made to the overall level of emissions. The BPP holds instead that proportionality in such a distribution should be calculated based on the benefits that agents have derived from emission-generating activities. Finally, the APP posits that the quota of burdens should be proportional to agents' relative capacity to bear such burdens.

All of the abovementioned principles aim to establish and justify positive responsibilities for sharing the burden of rectifying the unjust situation created by the actions that have caused climate change. Instead of relying on any one principle, this moral analysis employs the hybrid version developed by Shue (2015). Shue (2015, 16) argues that 'those who contributed heavily to creating the problem of excessive emissions thereby both benefitted more than others and became better able to pay than most others'. This convergent principle appears to fit the case of oil companies perfectly and provides a moral justification for their duties of reparation and decarbonisation. This hybrid, convergent understanding of the moral bases of oil companies' duties generates different rectificatory actions included in the duties of reparation and decarbonisation.

5. Duties of reparation and decarbonisation: structure and duty recipients

To prevent harming humanity and the planet, responsibility requires oil companies to undertake actions (a) to better cope with the effects of climate change through rectification of the harm already done and prevention of future harm, and (b) to stop causing climate change through the reduction and eventual termination of their harmful activities. These actions can be articulated respectively in the form of the duties of adaptation and mitigation, as usually discussed in the relevant literature (e.g., Caney 2010; Vanderheiden 2011). The duty of adaptation requires moral agents to support efforts aimed at preventing climate change, adapting to its impacts and compensating for non-

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adapted or mitigated impacts. The duty of mitigation requires moral agents to curb anthropogenic GHG emissions and/or enhance their sinks to avert dangerous interference with the climate system.

A distinction between duties of adaptation and mitigation is undoubtedly a helpful one in the general context of climate ethics. However, in the specific case of oil companies, these duties require a more contextualised and nuanced interpretation. The current analysis articulates the duties of reparation and decarbonisation as specific manifestations of the duties of adaptation and mitigation, respectively. These names reflect and emphasise the kinds of actions required of oil companies in light of their moral responsibility and unique agency related to climate change.

The Duty of Reparation: Structure of the duty and forms of rectificatory actions

The duty of reparation captures the need to ensure that oil companies rectify injustices faced by those who undeservedly suffer harm from climate change caused by burning fossil fuels (Vanderheiden 2011; Shue 2015). This duty posits that oil companies should 'disgorge' part of the funds they have accumulated from their harmful activities to help those affected by climate change to prevent and/or adapt to climate impacts and to compensate for non-adapted or non-mitigated impacts.

To frame and better understand the duty of reparation, as well as the form it should take – point (iii) – it is useful to consider oil companies as moral agents that, through their harmful fossil fuel-related activities, have benefitted from the suffering of others. According to Pasternak's (2014) categorisation of wrongful beneficiaries, oil companies would be 'voluntary beneficiaries', since they know of the wrongdoing and could have avoided it without incurring unreasonable costs, but which instead have sought and welcomed it (Facts 2, 4 and 6). As 'voluntary beneficiaries', oil companies must rectify the harm done by supporting the affected parties in relation to the harm they caused. There are different ways to support them: from immaterial approaches, like public acknowledgment and apologies, 'naming and shaming' or establishment of the truth, to material rectification of historical wrongdoing. In the context of climate change, much remains to be done in practical terms to reduce the harmful impacts of fossil fuel production. Rectification, therefore, must be primarily material and ought to aim at minimising climate impacts through practical actions.

There are different forms of material rectification, too. For example, restitution implies returning misappropriated things to the rightful owners or their successors, and compensation means compensating the rightful owners or their successors for the harm done. Unfortunately, applying the duties of restitution and compensation is highly problematic considering the complex nature of climate change since both require identification of the recipient of such duty (Goodin 2013). Given the substantial temporal and spatial lags between carbon emissions and their impacts, it is virtually impossible to identify the rightful duty-recipient or a legitimate successor with certainty. Moreover, in the case of restitution, the context of climate change makes it close to impossible to identify the 'misappropriated thing' apart from a rather abstract notion of atmospheric absorptive capacity, which was wrongfully overconsumed by carbon majors' emissions.

Whereas restitution and compensation approaches fail, disgorgement appears to be more appropriate. Disgorgement requires only the relinquishment of the fruits of historical wrongdoing: in the case of carbon majors, their tainted benefits. Unlike restitution and compensation, the disgorgement form of rectification focuses on the duty-bearer, not the duty- recipients and their welfare (Goodin 2013). A remarkable example of implementing the moral provisions of disgorgement has already occurred in the case of art stolen by the Nazis from heirless Jews during World War II. After the war, the art was sold, and the proceedings were put into a fund providing support to Holocaust survivors (O'Donnell 2011). Disgorgement does not require the identification of a particular duty-recipient or speculation over how she would have been today had the past wrong not occurred. The potential and the advantage of disgorgement lies in its informational parsimony that makes it much more feasible, especially in the complex situations created by climate change.

It is worth noting that not all benefits that are attributable to oil companies' historical wrongdoing should be viewed as 'tainted'. For example, tainted benefits would not include charity donations or benefits to communities that emerged as a result of oil-related operations. A satisfactory theoretical proxy and a sound pragmatic measure for oil

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companies' tainted benefits can be their profits; yet, not even all profits would count as such. In case of the oil industry, the notion of wrongdoing reasonably applies to their emissions since 1992 (the presentation of the first IPCC assessment report at the Rio Conference). After this point in time, ignorance about the consequences of carbon emissions and alleged impotence of oil companies to reduce them became inexcusable. The profits of oil companies since 1992 offer a practical measure of the tainted benefits they should disgorge.

Duty recipients

Finally, to articulate the duty of reparation, it is necessary to identify who should be entitled to the disgorged funds. The agents most vulnerable to the harmful impacts of climate change should be the rightful duty-recipients. Vulnerability to climate change impacts is not simply about the risks of harmful events occurring. Rather, it is about the preparedness and capacity of different groups to cope with these effects. In this light, it is useful to clarify the notion of vulnerability, which, applied to social systems, is also termed social vulnerability (Brooks et al. 2005). Social vulnerability could be broadly understood as a state of well-being pertaining directly to individuals and social groups. Its causes are related not only to climate impacts but also to social, institutional and economic factors, such as poverty, class, race, ethnicity, gender, etc. (Paavola and Adger 2006). Social vulnerability produced by climate impacts endangers a number of critical aspects of well-being, such as life, health, livelihood, etc.

The degree of social vulnerability can be used for defining duty recipients' level of entitlement to the disgorged funds: the greater their social vulnerability, the larger the rectification through disgorged funds. Shue's (1999) third general principle of equity clearly endorses a stringent normative imperative of putting the most socially vulnerable first.

At the same time, there is another group of vulnerable agents, perhaps not subject to actual climate harm, but who could suffer a different kind of loss deriving from the shrinking financial capacity that the duty of reparation imposes to the oil industry (and, indeed, from commitments to the low-carbon transition required by decarbonisation). These agents are the displaced workers of the industries – fossil fuel and other industries, such as chemicals, transport and shipping – damaged in terms of job loss/reduction of opportunities by this transition, as well as frontline communities along the fossil fuel supply chain: they can be defined as direct victims of a low-carbon transition (Sovacool 2021). It should be emphasised that the inclusion among duty-recipients of displaced workers and impacted communities enlarges the scope of the duty of reparation beyond the strict moral boundaries of the financial rectification of the harm generated by fossil fuel-related activities. The rationale for this choice is eminently pragmatic; on the one hand, a wider scope greatly increases the acceptability and feasibility of the duty of reparation; on the other hand, the establishment of a separate fund for displaced workers and impacted communities would probably be too cumbersome for the already overburdened international governance of climate change.

In practical terms, reparation can take the form of a fund similar in its objectives to the Earth Atmospheric Trust envisaged by Barnes et al. (2008) aimed at helping people most vulnerable to climate change impacts.

The duty of decarbonisation: Structure of the duty and the form of rectificatory actions

To address the harm produced by its fossil fuel-related activities, the duty of decarbonisation requires the oil industry to eliminate carbon emissions from its business model (Shue 2017). Decarbonisation means adopting non-carbon intensive business models to eliminate carbon emissions from companies' operations and products. To decarbonise its products, an oil company would have to either cease its operations completely or transition to distributing low- or zero-carbon-intensive products, such as renewable energy. Such efforts would be consistent with the mounting pressure for phasing out fossil fuels (Grasso 2022).

A broad understanding of decarbonisation should not be confused with two narrower interpretations. One would only compel oil companies to comply with binding emissions limits set by some legitimate political and regulatory bodies (e.g., states, environmental agencies, local, national, regional, international authorities with enforcement power, etc.). This narrow commitment to decarbonisation depends on the willingness of legitimate authorities to set and enforce binding emissions limits, while a broader notion of decarbonisation entails much thornier governance-related behavioural and institutional issues. The second narrow interpretation implies only decarbonisation of oil companies'

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operations, like reducing the carbon footprint of their offices around the world. Some companies have already engaged into such actions, which in essence have served the purpose of 'greenwashing' their image. The famous case of BP rebranding itself from 'British Petroleum' to 'Beyond Petroleum' is one such example (Pearce 2008). Decarbonising operations (and not products) of oil companies is clearly insufficient, considering that these companies distribute fossil fuels to the global economy.

Carbon emissions largely result from the use of the oil industry's products by various agents, which contributes to the atmospheric greenhouse effect (see Buizza in this volume). Considering that carbon emissions are the commonly accepted 'currency' of climate justice, framing and accounting for the burden of decarbonisation imposed on oil companies in terms of emissions is the logical course of action. In this light, decarbonisation implies extensive and systematic reductions in the carbon emissions generated by the products and activities of oil companies.

Such burdens should be distributed among oil companies proportionally to their cumulative emissions, which represent a measure of their harm-generating activity over time (Grasso 2012). For example, the oil companies that contributed the most to global emissions should curb their fossil fuel-related activities at a higher rate, with a speedier pace and with larger reductions than other oil companies. Any 'carbon allowances' that may be assigned to oil companies according to this logic should be gradually reduced to zero over time.

Duty recipients

Given the global nature and spatial unpredictability of harm-reduction generated by oil companies' decarbonisation, all of humanity is the duty-recipient.

6. Possible developments

If oil companies act on their responsibilities and duties, there may be different possibilities for their actions to unfold. The harshest (and least likely) possibility would involve an abrupt dissolution of oil companies as a result of immediate termination of their fossil fuel-related activities. Let us call this option 'Sudden End'. From the perspective of justice, this abrupt termination would help prevent harm from any future fossil fuel-related activities. However, at the same time, it would rob victims of climate change from fair reparations for their suffering and for adapting to non-mitigated consequences of climate change. The 'Sudden End' scenario would also put in jeopardy some of the more vulnerable shareholders of the oil industry, such as pension funds and their individual account-holders. Thus, though attractive from the perspective of preventing future harm, this scenario is not functional from the point of view of disgorgement. In fact, there appears to be no ideal scenario from a justice perspective – all possible courses of action imply some degree of compromise among different justice concerns.

Another possibility would imply phasing out fossil fuels from oil companies' operations and products more gradually. Let us call this scenario the 'Just Transition'. Compensation and obligations towards more vulnerable shareholders make a strong case in favour of 'keeping oil companies alive' to ensure they do the maximum of what justice requires of them. This scenario would be less disruptive than the 'Sudden End' to the fossil fuel-dependent global socio-economic system, including the interests of some states (especially in the case of NOCs) and other businesses (which rely on fossil fuels, such as chemical or automotive industries). This does not change, though, the ultimate goal of the 'Just Transition', which is complete phasing out of fossil fuels from oil companies' operations and products, over the period of several decades.

The 'Just Transition' can take various shapes in terms of length and a combination of decarbonisation, compensation, business-as-usual (BAU), offsetting emissions, etc. The range of possible transition scenarios could vary from slow and ineffective BAU coupled with 'greenwashing' efforts, to BAU coupled with enhanced compensation efforts, or more rapid phasing out fossil fuels and switching to other, non-carbon-intensive business models. Notably, trade-offs between the duties of reparation and decarbonisation are inevitable. In practical terms, oil companies have finite budgets and will need to prioritise the most appropriate course of action. Yet, it is difficult to argue in favour of one strategy over another in abstract terms: both reparation and 'full' decarbonisation are critical from the justice perspective. Future research could address this conundrum in a contextualised way and offer a more

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nuanced exploration of the relative weight of each duty. More in-depth theoretical discussion of various perspectives on 'Just Transition', as well as its practical policy implications, is also necessary.

Conclusion

Oil companies' activities of exploration, extraction, refining, use and distribution of fossil fuels generate emissions of GHGs that are harmful for the planet and for humanity. This chapter maintains that oil companies have a positive responsibility to reduce and eventually stop their harmful activities and to rectify the harm they have caused. Such responsibility originates from oil companies' violation of the no-harm principle, which compels moral agents to refrain from acting in certain ways in order to prevent and/or avoid causing harm to others. This analysis articulates oil companies' responsibility in the form of two duties: a duty of reparation and a duty of decarbonisation.

The duty of reparation requires that oil companies disgorge their tainted benefits as an appropriate form of rectification of their historical wrongdoing. From a practical standpoint, this can be achieved by putting their post-1992 profits, a satisfactory theoretical proxy of the tainted benefits, in a fund aimed at helping the people most socially vulnerable to climate change to cope with its impacts. The duty of decarbonisation requires oil companies to engage in a large-scale transformation to radically alter their business model and progressively eliminate all carbon emissions from their operations and products.

By specifying and vindicating the duties of reparation and decarbonisation, this analysis aims to contribute to the creation of a normative basis needed to justify the inadequacy of the prevalent socio-economic practices of the oil industry in the broader context of the moral progress of humanity (Jamieson 2017). Condemning these practices as morally unacceptable could lead to the emergence of a social norm, which would delegitimise the current fossil fuel-centred behaviour of the oil industry, as happened for other, once deeply entrenched and influential socio-economic practices, such as slavery (Finnemore and Sikkink 1998).

In the absence of a moral analysis of the role of the oil industry in climate change, a normative perspective that justifies and outlines the responsibility and consequent duties of oil companies could provide a helpful initial normative framework for a reasoned dialogue with civil society and amongst political representatives belonging to different political traditions and subject to different political constraints. Despite their alleged abstractness, the duties of reparation and decarbonisation are moral provisions with immediate relevance to international climate governance.

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