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Sharing the Burden: Climate responsibility beyond the nation-state

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Abstract

Crafting an adequate and cohesive global response to climate change has presented a monumental challenge. Fairly distributing climate responsibility has been a key obstacle. Traditionally, climate responsibility has focused on the nation-state, yet these methods of responsibility allocation have failed in their key goal; to drive effective action to respond to the social and environmental consequences of climate change. This paper seeks to strengthen the link between the theoretical allocation of climate responsibility and the creation of genuine and effective action on climate change across societal sectors. Building on currently accepted methods of responsibility allocation, particularly the 'Carbon Majors', I present a novel approach to climate responsibility that is relevant to nation-states and corporate entities. This is achieved by utilizing mapping technology to clearly demonstrate the active transfer of wealth during the production of greenhouse gases from oil extraction location to end recipient in company shareholders, an aspect that is largely missing from current discussions. Two multinational oil companies, Equinor and BP, are used as case studies, to provide an example of both a majority state-owned and a publicly owned company. The isolation of shareholders, who also have roles as citizens of nation-states, as the destination of wealth from greenhouse gas production illuminates a useful connection between nation-states and companies in the context of climate change action.

Author's Note

My name is Oliver Fryett, and I am a final year Bachelor of Science student at the University of Tasmania in Hobart, working within the Department of Geography, Planning and Spatial Sciences. Having long been concerned with the lack of action to combat climate change, particularly within my home country of Australia, I was lucky enough to receive a summer scholarship to work on this paper. Given that climate change is a problem of the atmospheric commons, which is not bound by our current political boundaries of the nation-state, I was motivated to explore how climate change can be better politically represented. I hope this paper broadens your understanding of climate responsibility, as it did for me.

Keywords: Climate change, climate responsibility, Carbon Majors, post-nationalism, wealth transfer, shareholder activism

Introduction

The Intergovernmental Panel on Climate Change (IPCC) (2018) reports that altering of the Earth's atmosphere through anthropogenic action has already caused warming of approximately 1 degree Celsius above pre-industrial temperatures and is likely to reach 1.5 degrees of warming by 2050. The impacts of these changes to the climate system already have been, and will continue to be, widely felt, reverberating through critical sectors including agriculture and food security (Anderson et al., 2020; Gomez-Zavaglia et al., 2020), human health (Linares et al, 2020; Watts et al., 2018) and biodiversity and ecosystem function (Nunez et al., 2019; Hillebrand et al., 2018).

Although there is a clear and pressing need to reduce the impacts of climate change, decisive actions culminating in sufficient reduction of greenhouse gases (GHGs) or an increase in adaption measures have continually failed to gain traction, despite an intense international focus on climate change, particularly in the Global North (Beuret, 2017). This is not to deny that attempts have been made, nor wins achieved, in addressing a notoriously difficult and wicked problem on a global scale (Incropera, 2016; Sun & Yang, 2016).

However, between 1990 and 2019, despite several international agreements to limit GHG emissions, more carbon dioxide has been released into the atmosphere than in all of history before 1990 (Stainforth, 2020). Since 1992, when the Rio Earth Summit was convened, total annual GHG emissions have increased by more than 40% to almost 50 billion tons of carbon dioxide equivalent in 2016 (Ritchie & Roser, 2020). Clearly, this signals the inadequacy of the response to the climate change threat. The United Nations Framework Convention on Climate Change (UNFCCC), signed at the 1992 Earth Summit, first formalized the concept of 'common but differentiated responsibilities' of nations to respond to climate change (United Nations, 1992, Article 3), enshrining two key points – the need to allocate climate responsibility and the primacy of the nation-state.

A nation-state represents the joining of the political state to the cultural and/or ethnic nation and is the current dominate global entity and is generally referred to as a country. Under this arrangement, the state becomes an instrument to unite, economically, socially and culturally, the nation. Forming the cornerstones of subsequent agreements, the allocation of climate responsibility and the nation-state have been treated as inseparable. While the territorial boundaries of the nation-state inform how climate action is governed, methods of climate responsibility are used to allocate costs and burdens stemming from climate action to the various polities under this governance. The inability or unwillingness of some nation-states to ratify their Paris Agreement pledges in national policy undermines the strength of the climate response, as nation-states require the cooperation of other states to effectively fulfill their functions, such as significant climate action (Biermann & Dingwerth, 2004). In parallel to the challenges of a territorial governance system responding to a problem of the atmospheric commons, Vanderheiden (2011, p. 65) describes determining climate responsibility as the 'primary obstacle to the

development of an effective climate regime'. It is evident then, that both obstacles must be overcome before climate action efforts can be furthered.

The importance of climate responsibility is linked to the concept of climate justice. Framing climate change as an ethical issue, taking a climate justice approach seeks to protect human rights while undertaking climate action (Robinson & Shine, 2018). There is a need to consider just actions in the context of climate change for two key reasons.

First, the underlying cause of climate change, anthropogenic GHG emissions, presents a vastly uneven geography. The early industrializing nations, of Europe and North America in particular, have contributed significantly more GHGs than other regions of the world (Hickel, 2020). As fossil fuel usage 'forms the fabric of our economy' (Bradshaw, 2010, p. 276), economic wealth is closely coupled to GHG emissions. Having grown wealthy through consumption of fossil fuels (Robinson & Shine, 2018), nation-states of the Global North are better equipped to deal with the impacts of climate change. However, the costs of GHG emissions are felt globally. People that have contributed little to the problem must contend with increased climate vulnerability, illustrated by measures such as the composite climate change vulnerability index (Edmond et al., 2020). This is particularly prevalent in the Global South, a term which stems from the generally southern location of decolonized countries. The Global South references regions that, due to the exploitative nature of the colonial experience and the continuing modern echoes of this relationship, are economically and political poorer than their counterparts in the Global North.

Secondly, accumulation of wealth has allowed early industrializing nations to hold significant leads in development areas such as health and education, while regions of the Global South struggle with issues of poverty. Enabling the improvement of the human condition in these areas, while avoiding the devastating impacts of further fossil fueled development, is central to the need for a just distribution of climate responsibility (Robinson & Shine, 2018).

This paper aims to develop a novel perspective of climate change responsibility, one which operates beyond the frame of the nation-state. The restrictions imposed on collective issues by the territorial geography of the nation-state and the current limitations of assigning climate responsibility form the rationale for the project. In particular, transfers of both wealth and power in the creation of GHG emissions are masked by the current systems of climate responsibility, and thus they provide a limited picture of the ability to respond to climate change. I begin by providing a critique of the current methods of allocating climate responsibility. Then, using mapping software as a primary tool, I seek to illustrate the transfer of wealth embedded in GHG production. The motivation behind presenting this information with maps is their effectiveness in conveying geographic relationships (Smelcer & Carmel, 1997) and improved comprehension and appeal to the public (Cao et al, 2016) over other mediums. Climate change requires global collective action, in which everyone is an actor (Jamieson, 2015). Therefore, no matter how seemingly important or insignificant an actor's role is, the script must be able to be understood for the performance to succeed.

Utilizing two case studies, Equinor and BP, the mapping exercise served two purposes; first, to explicitly draw attention to wealth transfer as an integral part of climate responsibility and secondly, to produce a novel framework that adds an

additional dimension to existing climate responsibility allocation. As two of the 'Carbon Majors', a climate responsibility method that assigns GHGs to companies, Equinor and BP were chosen because transnational corporations best represent the unbound commons of the atmosphere. Shareholders were made the focus of the project, because of their primacy within a company. Conventionally, the purpose of a company is to maximize shareholder wealth (Rhee, 2017), and so shareholders of fossil fuel corporations serve as the destination of wealth created from the GHG production process. It is important to distinguish shareholders from stakeholders, as shareholders hold a vested interest in a company. In comparison, stakeholders, a group which shareholders form one part of, 'include internal, external, and environmental constituents' (Tse, 2011, p. 57). The two companies vary in their shareholder composition. Equinor is partially privatized, as the Norwegian Government owns 67% with the remainder held on public share markets (Equinor, 2020), whereas BP is a publicly listed company. This provides examples of the two main types of companies listed in the Carbon Majors. I build on the Carbon Majors approach, using the framework of wealth transfer, with the goal of more effectively empowering climate action through responsibility allocation.

Representing Climate Responsibility

Allocating climate responsibility then presents a moral and a practical challenge. The question that forms the core of the challenge remains relatively simple: How are responsible actors identified and what share of the responsibility do they hold? Despite the simplicity of the question, answering has proven to be anything but. In particular, the question of how responsibility is identified is intrinsically linked to questions about how actors may be encouraged or coerced to accept this responsibility. Thus, representation in systems of responsibility becomes important; an actor's responsibility must be visible for it to be accepted. Identification requires an assessment of the individual contributions to harm caused by a collective (Vanderhieden, 2007), and many of the contributions are socially acceptable or even encouraged. Consider commuting in a petrol-powered car. It is an act that undoubtably contributes to the human-induced greenhouse effect, as transport is the second largest contributor of GHGs in Australia (Climate Council, 2016). However, determining moral responsibility is more imprecise. Is the commuter held responsible for not choosing a greener method of travel; perhaps the car manufacturer or oil company for encouraging the consumption of goods harmful to the environment; or is the government at a state or federal level failing to promote alternative transport?

To assist with the moral challenge of allocating climate responsibility to maximize efforts to mitigate, adapt to and compensate for climate change, tools such as quantitative data and mapping are widely used. As discussed earlier in this paper, mapping is an effective instrument for conveying geographical relationships. Data takes a variety of forms, such as tons of carbon dioxide or more complex indicators like climate vulnerability indexes (calculated using several forms of other data). Nevertheless, as GHG emissions are the underlying cause of anthropogenic climate change, the dominant structure informing climate responsibility has been the allocation of GHGs.

Traditionally, GHGs have been assigned to the nation-state where they are emitted. Under the current global order, territory is considered sacred and owned strictly by one nation-state, a characteristic which is applied in this form of GHG accounting. Termed the territorial method, it has formed the basis of agreements under the UNFCCC (Hickel, 2020) and thus formed a key part of climate action attempts. Figure 1 illustrates annual carbon dioxide emissions, the most voluminous of the GHGs, in 2019. With large emitters marked by darker colors, GHG emission is concentrated in the Global North, with China, India, Indonesia, and the oil producing states of the Middle East featuring. Only a small quantity is produced in Africa.

Significant emissions are embedded in international trade, which is not considered under territorial methods. Between 20 and 25 percent of carbon emissions are moved internationally (Afionis et al, 2017), creating a requirement for relationships between exporters and importers to be considered in climate responsibility. The development of the consumer-based accounting has addressed this restriction by assigning GHGs to the consumer of a product, rather than its producer. Afionis et al (2017) describes the consumer method as the most prominent alternative to a territorial approach, supported by its inclusion in the United Nations Emissions Gap Report 2020. Under the consumer method, China's GHGs are reduced in comparison to the territorial method, due to its large export of goods, while the United States and Europe's emissions share increases (Figure 2). This demonstrates that while goods consumption has remained high in Europe and the United States, production of these goods, and therefore GHG production, has been shifted overseas.

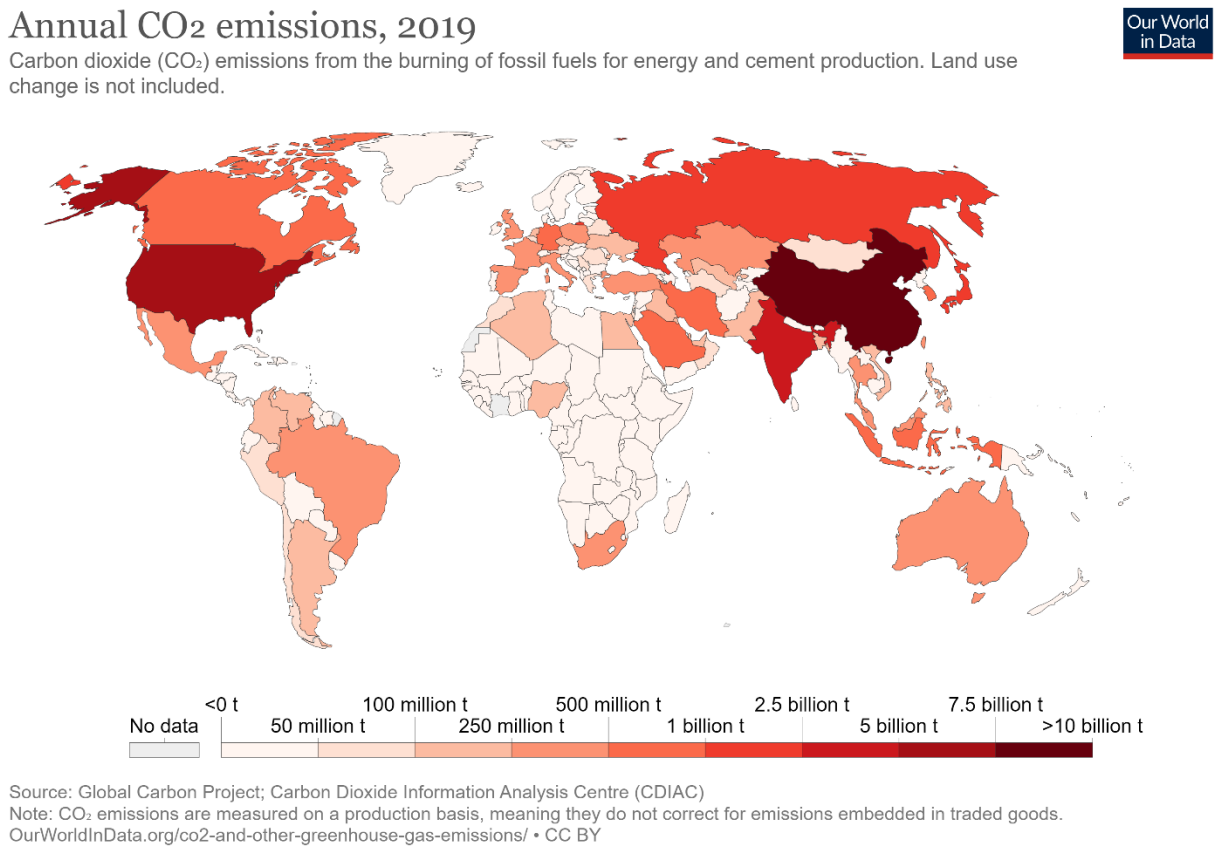

Figure 1. Annual Territorial Carbon Dioxide Emissions 2019. Source: Ritchie and Roser, 2020.

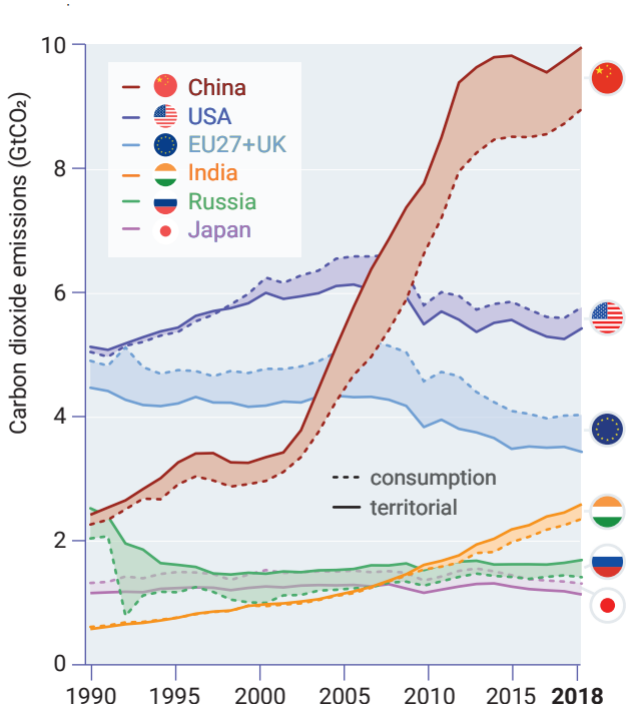

Figure 2. Comparison of territorial and consumption methods of allocating C02 emissions. Top 6 emitters are shown. Source: United Nations Environment Program, 2020.

The limitations of territorial and consumer-based accounting have created a need for differing approaches to applying responsibility using GHGs. Hickel (2020) argues that the stores of GHGs in the atmosphere, not merely annual contributions, are the critical factor in the severity of climate change. Therefore, historical emissions demand greater consideration in assigning climate responsibility. To determine this responsibility, Hickel uses the safe planetary boundary of 350 parts per million of atmospheric CO^2 as a reference point: 830 gigatons of CO^2 could be emitted globally before this limit was crossed, which occurred in 1990. Each country was then allocated a 'fair share' of this budget, based on population. For example, because of their larger population, China would be allocated a larger share of the budget than Australia or Canada.

Based on culminative territorial and consumption emissions between 1850 and 2015, nations that overshot their fair share were said to be in climate debt and therefore responsible for climate breakdown. Those remaining within their boundaries had a climate credit; able to continue producing GHGs without bearing responsibility. Current large emitters such as India and China remain in climate credit as of 2015, while the United States, having overshot its share by 40 percent, carries the bulk of climate responsibility (Figure 3). The vast majority of climate debtors are located in the Global North, with just 8 percent of debt held by the Global South (Figure 4), displaying a disparity between historic emissions and the North's fair share

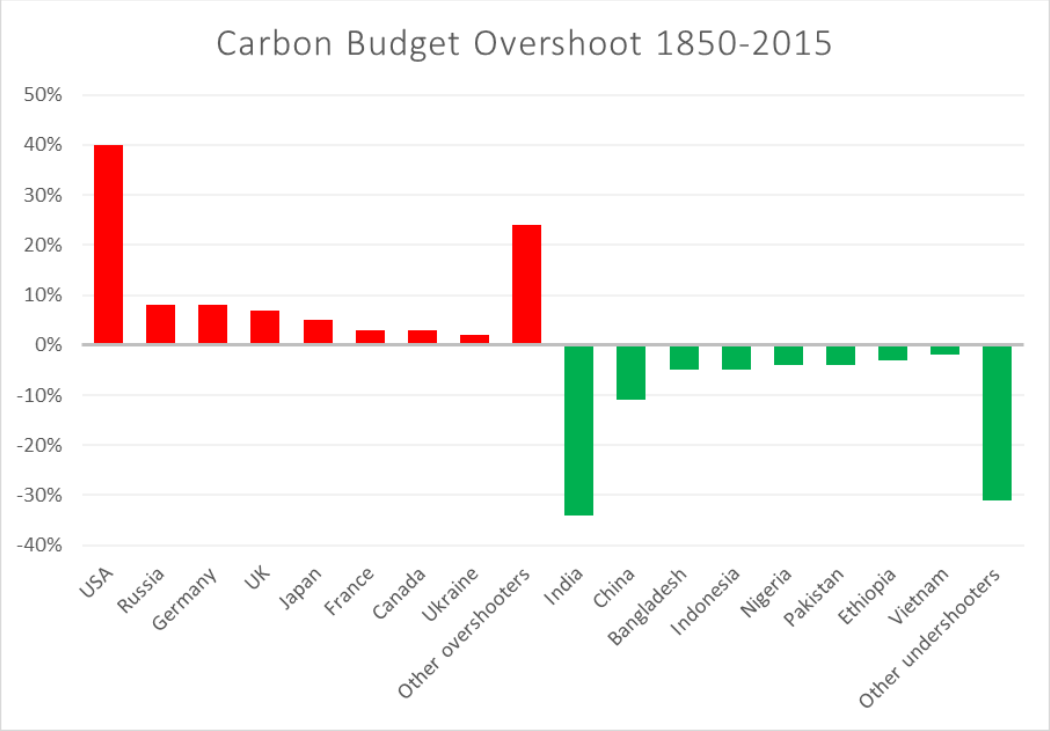

Figure 4. Climate Creditors and Debtors, based on national 'fair share' carbon budget. Data Source: Hickel 2020

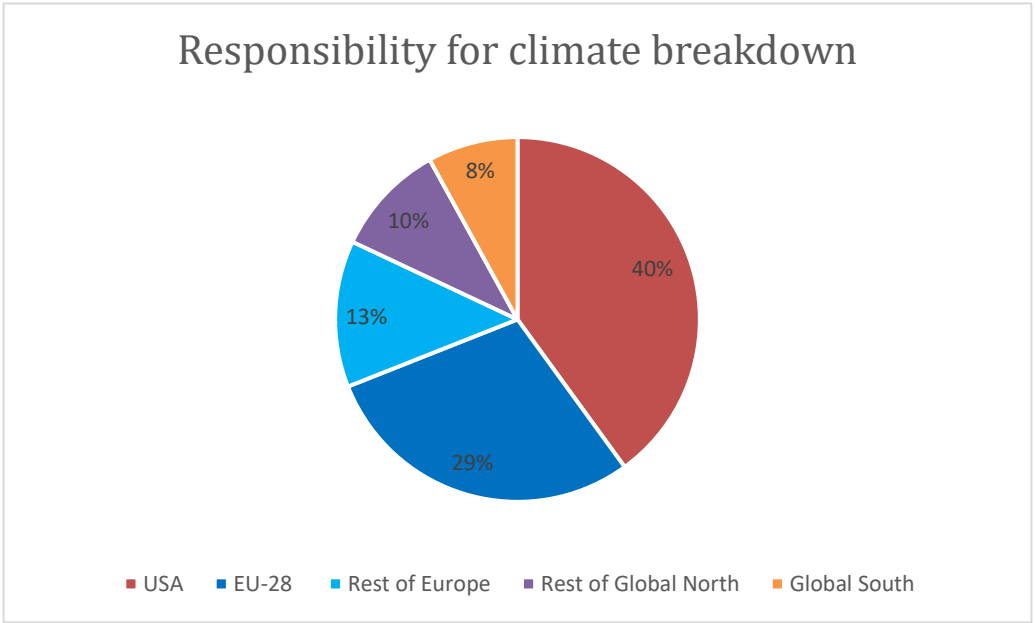

Figure 3. Responsibility allocation based on carbon budget overshoots by selected region. Data Source: Hickel, 2020.

While the above approaches differ, they share the common vessel of responsibility, the nation-state. Heede (2014) advocates for a different path; analyse emissions in the context of corporate actors. GHG emissions were traced to the large fossil fuel and cement producers, known as the 'Carbon Majors'. Citing the considerable benefit that companies have gained from GHG production, as well as the financial and technical capability, Heede argues the Carbon Majors hold '…an ethical obligation to help address climate destabilization' (p. 236). Applying this lens, 108 companies are responsible for almost 70% of GHG emissions since 1751 (Heede, 2020). An important consideration in determining responsibility for the Carbon Majors is their ownership or leasing rights of remaining fossil fuel reserves. If burnt, the GHGs from these reserves would undoubtably make limiting warming to 2 degrees an impossibility (Dale, 2015).

Despite the range of approaches to allocate climate responsibility, their effectiveness in progressing climate action has been limited. I attribute this to several factors. Firstly, none of the methods of allocating responsibility adequately trace or show the transfer of wealth. This draws on Robbins's (2020) notion that environmental change cannot be completely explained without consideration of who benefits from changes in a resource, and who takes what from whom. Because of the key role of fossil fuel consumption and GHG production in accumulating capital within the modern capitalist system, the copious resources moved, and the potential harm caused, this factor takes on critical importance. The consumer method gives some consideration to who benefits from producing GHGs, as does the Carbon Majors, however benefit is implied through the assumption that greater emission levels result in greater benefit. I argue that in these approaches transfers of wealth are not suitably explicit, and to fulfill Robbins's examination, the flow of benefits must be traced from original production location to end benefactor.

This connects to the second factor; responsibility is allocated at high-level polities such as the nation-state, or large corporations in the Carbon Majors. The incompatibility of the territorial nation-state system with the collective climate problem presents a troublesome hurdle, although this is not the only weakness of using high-level polities as the end point for responsibility. Doing so places blame on all members of a grouping, particularly if a per-capita metric is used, smoothing unevenness within that group. In the Australian context, a Sydney executive would contribute many times the GHGs of a remote community in Arnhem Land, yet their share of Australian emissions is the same. Additionally, it also largely leaves resolutions to institutions such as government or the United Nations. Feelings of disempowerment and lack of agency are key issues in the conceptualization of climate change, with young people in particular overwhelmed with a problem of such magnitude (Jones & Davison, 2021). By shaping questions of responsibility at high levels, pathways to meaningful action are placed out of reach of many, reinforcing disempowerment and forgoing potential climate action opportunities.

Responsibility, transfer of wealth and empowerment

Promoting pathways for constituents of large actors to take action within the framework of the nation-state or company are therefore essential to remedy the situation of disempowerment. Similarly to formal education settings creating

emotions of disempowerment because of an inability to transfer knowledge into action (Jones & Davison, 2021), allocating climate responsibility provides important information to citizens or shareholders, without providing pathways for these small actors to implement this knowledge. Rectifying this issue could have massive implications for climate action. Unlike institutions, which largely occupy one role in society, people fulfill multiple roles, whether it be as a consumer, a teacher or voter. Adding dimensions to the Carbon Majors to better empower shareholders to act by changing their performance of that role not only creates a site of action within a company but serves to spread experimentation into other roles (Connolly, 2013). An accumulation of these experiments across a variety of roles can make a difference, creating multiple avenues for social action (Ford, 1996) whilst inspiriting others to do the same. It also bridges the gaps between the multiple methods of allocating climate responsibility, currently working independently of another, allowing them instead to exist in parallel and through each other. Climate change requires the cooperation of all actors (Biermann & Dingwerth, 2004), necessitating the rejection of a binary approach to responsibility and an advocation for multiple integrated responsibilities, both horizontally and vertically.

Method

To represent the transfer of wealth linked to GHG emissions, the locations of physical extraction of a GHG source and sites of wealth accumulation linked to this extraction had to be determined. The complexity of the issues involved, uneven public availability of secondary data, and the scale of this research project informed the decision to adopt a case study methodology with centered both on a specific GHG source, oil, and on specific organizations, Equinor and BP, two of the corporate Carbon Major's identified by Heede. The decision was made to focus on annual oil production given oil's preeminence in the global economy, and the difficultly in substituting it for cleaner alternatives due to its transportability and high energy, critical to the transport sector. Oil makes up 52% of Equinor's revenue (Equinor, 2020, p. 26) and although the contribution to BP revenue could not be determined, it is likely to be similar. Annual reports of BP and Equinor, both publicly available, were used for this purpose as they contain breakdowns of oil production by location. Equinor's data was more specific, providing an account of production by oil field, while BP's analysis was by nation-state with the exception of the United States, which separated Alaska, the lower 48 states and offshore drilling in the Gulf of Mexico.

The flow of wealth was then to traced to shareholders of the case study organizations, determined for the purposes of this study as the end point for capital accumulation. The companies themselves do not make available, nor are likely aware, inventories of individual shareholders, as stocks are often held through a range of investment vehicles, including mutual funds, super funds and banks on behalf of investors. To overcome this, the top five large investors of each company, which are publicly available, where used as placeholders. In their Investors section of their website, Equinor publishes a list of their largest shareholders. Under disclosure laws, BP does publish some shareholders in its annual report, however this was not exhaustive enough for the study's purposes. Instead, institution investor information

was obtained from NASDAQ's BP plc listing, judged to be sufficiently robust because of regulations governing stock market information. In order to show the spread of shareholders represented by these investors, office locations of each were gathered from their respective websites. This was based on the assumption that institution investors would have office locations where large numbers of clients were located. Where office location could not be determined, the investor was replaced by the next largest (e.g., 6th largest).

Extraction locations, together with the respective 2019 production levels, were tabulated for each company, as was the list of shareholder locations. Latitude and longitude co-ordinates were added to each of these locations to allow GIS software ArcGIS to produce a point layer for each table using the X-Y Table to Point tool. Appropriate symbology was then applied to create maps.

Results

The case studies reveal a sharp contrast between the global geographies of shareholders (or wealth accumulation) and oil production (wealth creation). Both Equinor and BP have a similar spread of shareholders who are concentrated in the Global North with pockets in China, India, South America, and the Middle East. BP has significant oil operations in the Middle East, reflecting its colonial origin as the Anglo-Persian Oil Company, Africa, North and South America and the North Sea. The large Russian contribution is due to BP's approximately 20 percent stake in Rosneft, the Russian state-controlled oil company. Comparatively to Equinor, the spread of BP shareholders more closely resembles the geography of production, although discrepancies remain. Africa is represented in Cape Town alone, and although Angola, Algeria and Alaska form almost 20 percent of BP operated production, there is not a shareholder within thousands of kilometres of these countries (Figure 5). In the case of Alaska, wealth transferred away from the state to shareholders is compounded by almost 40 percent of oil and gas industry workers residing elsewhere (DeMarben, 2018).

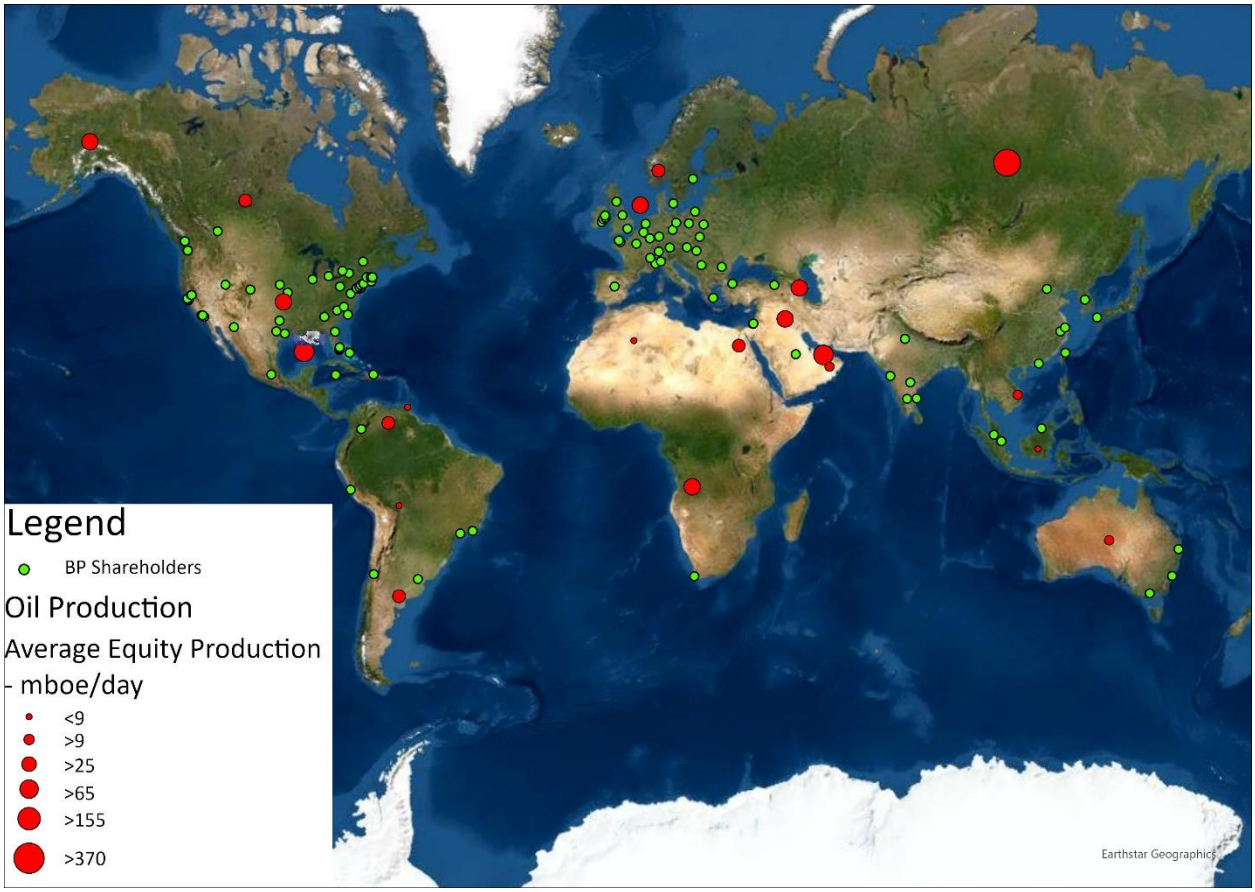

Figure 5. BP Shareholder and Production Locations. Data Sources: BP 2020, Nasdaq 2021.

On the other hand, while state-owned Equinor extracts the majority of its oil from Norway's domestic North Sea reserves, a sizable contribution is produced by oil fields in North America and Africa. While America and Canada contain a multitude of shareholders, the entire African continent of some 1.3 billion people is represented by one office in Cape Town, South Africa (Figure 6). The wealth transferred to shareholder from oil production is significant: Equinor delivered dividends of 3.3 billion USD in 2019 (Equinor, 2020, p. 157), while BP paid 6.9 billion in the same period (BP, 2020, p. 156). 2019 GHG emission data was unavailable, but in 2018 the two companies were responsible for 288 and 549 million tons of CO2 equivalent respectively (Heede, 2020a, b) emitted during the wealth transfer process. For every ton of GHG emitted, shareholders of Equinor profited $11 and BP $12.

Flows of wealth, as well as uneven environmental burden, also occur within nation-states. In addition to wealth transferred away from the extraction location, the uneven environmental and social harms caused by oil production are highly localised to the production area (O'Rourke & Connolly, 2003, p. 593). The BP Deepwater Horizon oil spill in 2010 is used as a discrete event to demonstrate this, shown in Figure 7, and the potential costs of oil production are clear. By superimposing the oil spill extent on the BP shareholder data, it can be easily discerned the Gulf states of Louisiana, Mississippi, Alabama, and Florida, some of the poorest in the United States, bear the monumental environmental and social cost of the disaster in addition to the impacts of climate change, while wealth generated from these operations is transferred to cities in the region, such as Houston, and further afield. These burdens are long-lasting (Eklund et al, 2019) and happen regularly: 137 oil spills occurred in the United States alone during 2018 (Cassidy, 2019).

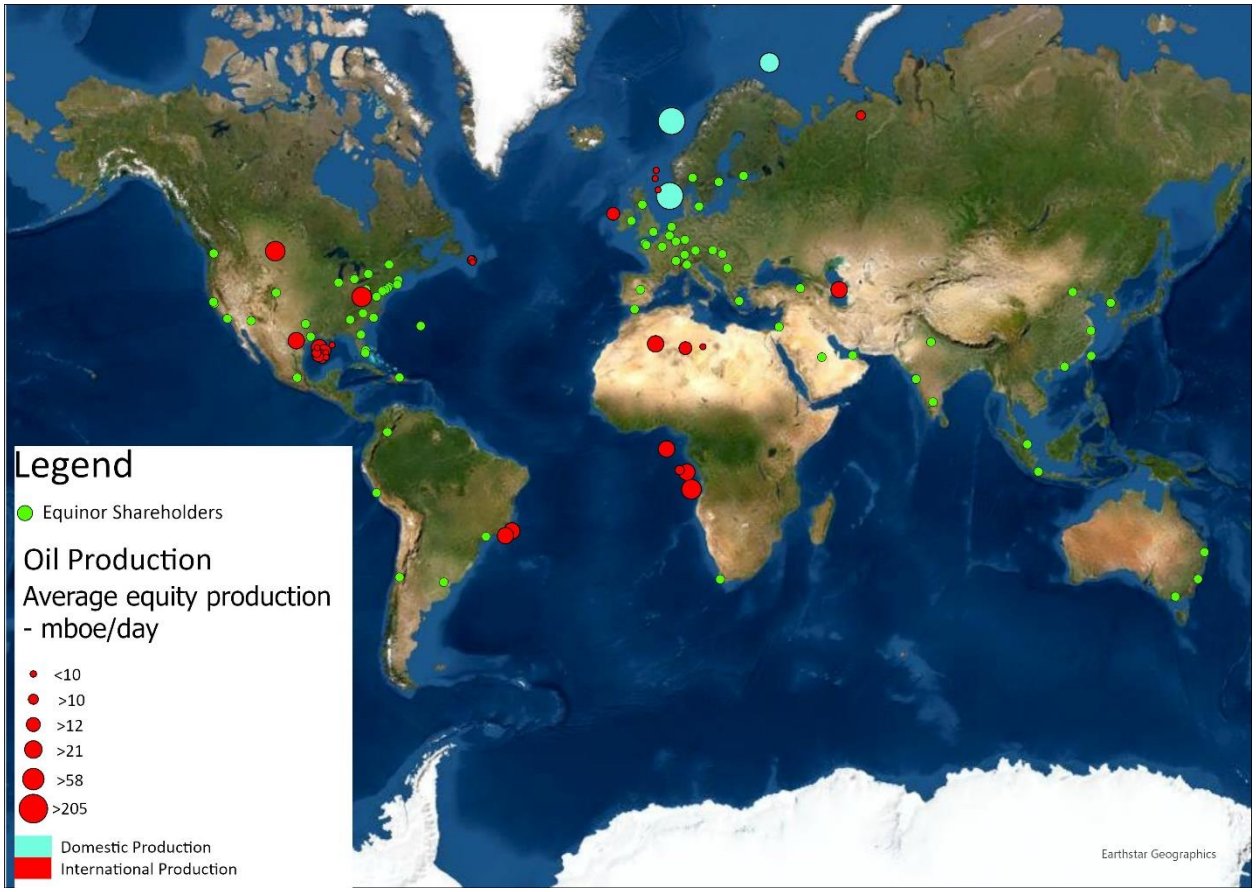

Figure 6. Equinor Domestic and International Production and Shareholder locations. Data Sources: Equinor 2020, Equinor 2021.

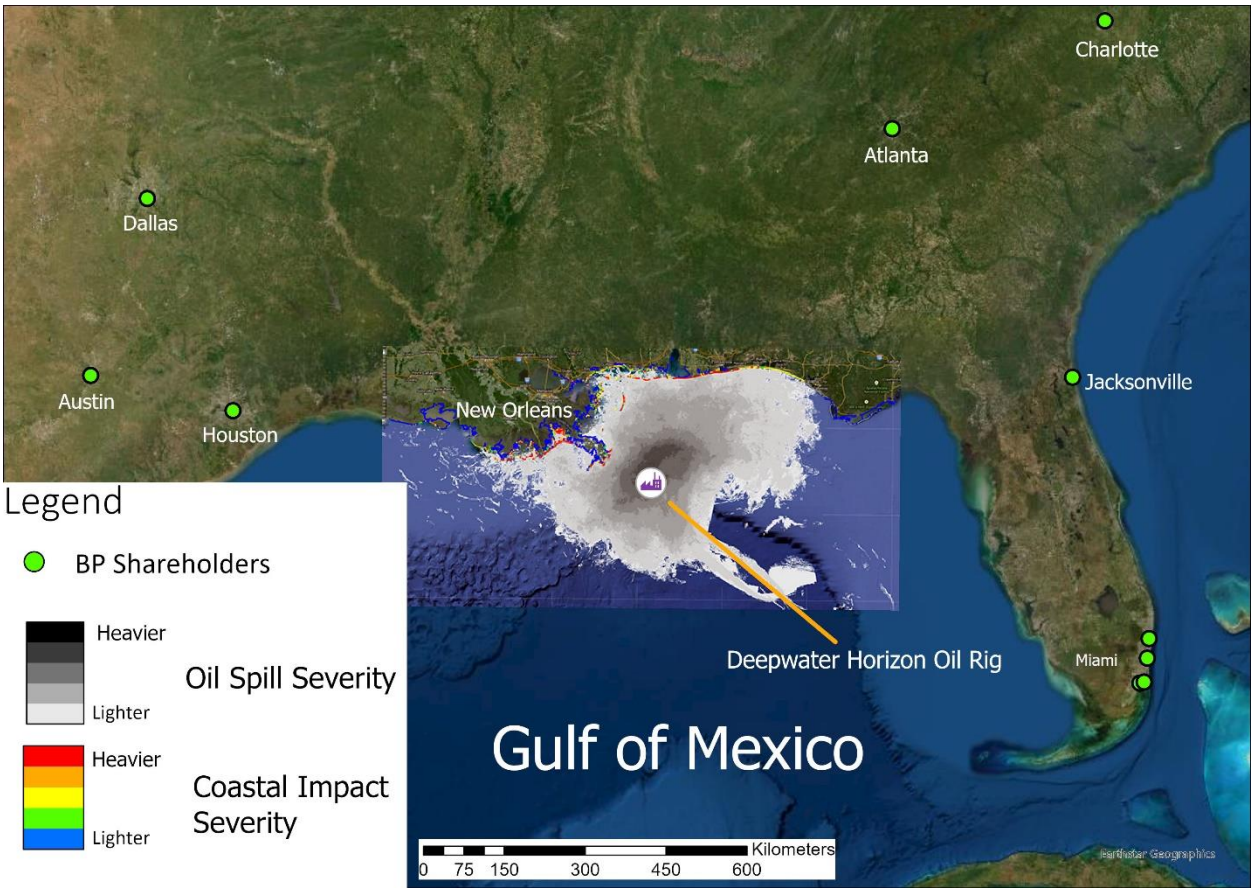

Figure 7. BP Shareholders in Relation to Deepwater Horizon Oil Spill. Data Source: Nasdaq 2021, Wagner et al. 2015.

Discussion and A New Framework

It is well established that the development and current wealth of the Global North has been largely due to fossil fuel exploitation (Robinson & Shine, 2018; Ortiz, 2020). This process of development has often been presented as a passive one, reflecting the 'natural' advantages of countries that have grown wealthy (Da Costa & Dias, 2015). However, this process has both been active and highly political, rather than natural, with the majority of the world's oil reserves found in the territories of relatively poor countries for example (O'Rourke & Connolly, 2003). Wealth is actively transported from oil extraction location, often in the Global South, to an often distance shareholder, and the magnitude of the wealth moved intensifies the effects of this movement. The process of fossil fuel production, which has created the collective problem of climate change, has worked to increase the vulnerabilities of extraction points to this problem through this movement of wealth. The environmental and social costs of oil production act as a multiplier to these vulnerabilities in the Global South, further burdening at risk communities. The Deepwater Horizion disaster demonstrated that the divide between North and South is fuzzier than groups of nation-states. The Global South exists as pockets in the Global North (Trefzer, 2014), hidden by focus on nation-states. Although these impacts do not directly cause climate change, they occur during the process of GHG production and benefit, and therefore must be considered when assigning burden in response to climate change.

The process of wealth transfer is poorly reflected in current methods of representing and allocating responsibility, and the Carbon Majors shareholder extension as defined in this paper aims to help rectify this. In addition to current production of corporate GHG emissions, it can be argued that shareholders bear some responsibility for the historic emissions of a company. The ability of a company to generate benefit for a shareholder in the present rests on the foundation of past activities, similar to the unjust inheritance of states described by Duus-Otterström (2014). For example, BP was built up over the past 100 years, and a key part of its success is the emitting of over 40 million tons of CO^2 equivalent (Heede, 2020a). If a shareholder is willing to accept the benefits created by a company, they must also accept responsibility for the foundation which the benefits are derived from. Beyond the scope of this paper, tracing the transfer of wealth through time presents an opportunity for further research.

Fused into the foundation is the knowledge of damages stemming from GHG production, which some oil companies were aware of as early the 1970s (Hall, 2015). Despite the ability to transition away from a harmful business model, in some cases for almost half a century, Carbon Majors continue to engage in GHG production. Further, many, such as BP, have and continue to actively resist climate action (Laville, 2019) and repeatedly protect their corporate image from poor environmental performance through 'greenwashing' (Kassinis & Panayiotou, 2018; Furlow, 2010). As beneficiaries of these 'do no harm' violations, an additional layer of moral responsibility must be added to the shareholder's climate responsibility that stems from pre-climate change warning GHG production.

A considerable climate responsibility then rests with the shareholder of a fossil fuel company. To ensure the effectiveness of this framework, owners must be aware of

their ownership. Shares are often held by institutional investors on behalf of banks and super funds, who invest customers' money to secure a return. The length and complexity of this ownership chain not only separates shareholders from the consequences of production, it reduces the ability for them to take responsibility and experiment with the role of owner. By shortening this chain of responsibility, generating wealth, through a super fund for example, becomes viewed as political act with practical and moral consequences. Actors can then be empowered to take control of their responsibility. Although initiatives such as divestment and increased shareholder activity are potential actions under this framework, the primary purpose is to multiply the sites of action across multiple sectors.

Transparency is critical to shorting the chain. Although initiatives such as the Task Force on Climate-related Financial Disclosures have made advances in this space, I argue the focus on financial risk and decision making encourages a shift away from climate breakdown contributors, and a dismissal of climate responsibility, rather than an acceptance of responsibility then used to motivate acts in multiple theaters. These initiatives can remain a useful tool, however disclosures that highlight the consequences of fossil fuel production, and the financial pathway leading to those consequences, could prove more effective. For shareholder climate responsibility to work, accessible information allowing an actor to determine their wealth is generated by companies such as BP or Equinor must be readily available and independently verified.

This is not to suggest that large actors, such as nation-states or companies, are relinquished of climate responsibility. Indeed, the proposed framework supports quite the opposite. It aims to increase avenues in which small actors can take action, place pressure on large actors to do the same, and help bridge the gaps between the multiple simultaneous methods of assigning climate responsibility required to tackle climate change. It thus works to multiply the sites of political action by encouraging experimentation in the roles that people occupy and to increase both collective and individual agency, with the goal of creating cracks in the systems which have either created or allowed anthropogenic climate change to evolve. Rather than the performance an obedient role, complicit in the renewal of these systems (Connolly, 2013), I seek to encourage active participation to propel climate action forward.

Conclusion

Responding to climate change presents the largest collective environmental and social challenge of the 21st century. However, current ways of representing and allocating responsibility for the causes of this challenge have failed to motivate and guide sufficient action. Given the colossal impacts of 2 degrees of warming, which the IPCC (2018) reports will take place under current Paris Agreement pledges, increasing the effectiveness of social processes of representing and allocating climate responsibility to create bolder climate action is critical. In addition, a deeper understanding the responsibility for climate change helps to more fairly allocate burdens garnered in responding to it, essential in ensuring a just approach to tackling the problem. This paper contributes to this essential work by adding additional dimensions to an existing responsibly method, the Carbon Majors. The key finding of this paper is the disparity between shareholder locations and sites of production in

both case studies, Equinor and BP. The processes of wealth transfer and the uneven geographies of accumulation and production during GHG production, and consequential climate breakdown, are therefore highlighted through this conclusion. Realizing the central role that creating action pathways occupies in effective climate responsibility, role experimentation is then used to multiply the sites of action that stem from the shareholder, allowing the different responsibility methods to work in tandem.

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