



NEGOTIATING CLIMATE CHANGE IN CRISIS

EDITED BY STEFFEN BÖHM
AND SIAN SULLIVAN



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Introduction: Climate Crisis? What Climate Crisis?

Steffen Böhm and Sian Sullivan

(At Least) Five Decades of Knowing and (Not) Acting¹

In all the talk about the Paris Agreement, reached at the twenty-first Conference of Parties (COP21) of the United Nations Framework Convention on Climate Change in Paris in 2015, it is sometimes forgotten that the world's political leaders have held negotiations about climate change at the highest possible level for at least three decades. Many have known about climate change for a lot longer.

It was in the 1860s that the Irish scientist John Tyndall first established a link between CO₂ and what then became known as the 'greenhouse effect', which was further evidenced by the Swedish scientist Svante Arrhenius (Pain 2009). In 1938, the British scientist and engineer Guy Stewart Callendar "documented a significant upward trend in temperatures for the first four decades of the 20th century and noted the systematic retreat of glaciers" (Plass et al. 2010: online). In 1956, the American scientist Gilbert Plass (1956) published a seminal paper called 'Carbon Dioxide Theory of Climatic Change', creating a clear link between increases in the concentration of CO₂ in the atmosphere and global temperature rises.

1 The first part of this introduction draws on an earlier blog article by Böhm, published as 'The Paris Climate Talks and other Events of Carbon Fetishism', <https://www.versobooks.com/blogs/2372-steffen-bohm-the-paris-climate-talks-and-other-events-of-carbon-fetishism>.

This scientific knowledge has thus been ‘out there’ for a very long time, and was also not unnoticed in the political arena. As early as 1965, the US President’s Science Advisory Committee

told President Lyndon Johnson that greenhouse warming was a matter of real concern. There could be ‘marked changes in climate,’ they reported, ‘not controllable through local or even national efforts.’ CO₂ needed attention as a possibly dangerous ‘pollutant’ (Weart 2021: online).

In the ‘mother country’ of fossil fuel burning, the United Kingdom, politicians became increasingly aware of climate change in the 1960s. In 1969, the House of Lords (the upper chamber in the UK parliamentary system) discussed railway policy and the hereditary peer Jestyn Philipps asked the following question:

[m]y Lords, can my noble friend say whether he and British Railways have taken account of the fact that what were abnormal temperatures last summer may not be abnormal if we continue to discharge CO₂ into the air by the burning of various fossil carbons, so increasing the greenhouse effect? (Carbon Brief 2019a: online).

Public opinion, particularly in the highly industrialised, most polluting countries, had shifted markedly towards an awareness of environmental issues in the 1960s and 1970s. In 1962, Rachel Carson’s influential and path-breaking book, *Silent Spring*, was published, becoming a bestseller worldwide. Anti-pollution, conservation and environmental protection movements sprang up everywhere. The first ‘Earth Day’ was held in the United States in 1970, becoming global in 1990 and marking the emergence of environmentalism as a serious social movement and political force (as also discussed by Hulme, this volume).² The world’s first green political parties were founded in 1972, in the Australian state of Tasmania and in New Zealand. The German Green Party, which subsequently became one of the most successful national green parties worldwide, was founded in 1979. Climate change was written on the banners of these environmental activists from the start.

The rise of environmental consciousness from the 1960s onwards also made the bosses of fossil fuel companies take note. We now know that the corporate leaders of ExxonMobil, one of the biggest oil companies of the world, had known about climate change and the unsustainability of

2 See <https://www.earthday.org/history/>.

their business models since at least 1977 (Hall 2015), as also clarified by Wright and Nyberg, this volume. During the 1980s, Exxon and Shell had extensive internal discussions and memos on climate change (Franta 2018). We are constantly told that companies are always listening to what their customers want. Well, already in the 1970s it became clear that an increasing number of customers were worried about the degradation of nature and climate change in particular. Corporate leaders would have been aware of this shift in public consciousness and attention. Given that what companies hate most are business risks, and that climate change is the biggest risk to an oil and gas company's business model, it would be logical to assume that these companies were making climate change risk assessments from these decades.

The 1980s saw the rapid expansion of environmentalism worldwide. In 1987, the World Commission on Environment and Development (WCED) published *Our Common Future*, which became known as the 'Brundtland Report', named after the Commission's chairwoman Gro Harlem Brundtland. While the Report had a wider remit, focusing on a whole range of environmental issues, it clearly stated that there is

the serious probability of climate change generated by the 'greenhouse effect' of gases emitted to the atmosphere, the most important of which is carbon dioxide (CO₂) produced from the combustion of fossil fuels (World Commission on Environment and Development 1987: 145–46).

It went on to say:

[a]fter reviewing the latest evidence on the greenhouse effect in October 1985 at a meeting in Villach, Austria, organized by the WMO, UNEP, and ICSU, scientists from 29 industrialized and developing countries concluded that climate change must be considered a 'plausible and serious probability' [...] They estimated that if present trends continue, the combined concentration of CO₂ and other greenhouse gases in the atmosphere would be equivalent to a doubling of CO₂ from pre-industrial levels, possibly as early as the 2030s, and could lead to a rise in global mean temperatures 'greater than any in man's [sic] history'. Current modelling studies and 'experiments' show a rise in globally averaged surface temperatures, for an effective CO₂ doubling, of somewhere between 1.5°C and 4.5°C, with the warming becoming more pronounced at higher latitudes during winter than at the equator [...]. An important concern is that a global temperature rise of 1.5–4.5°C, with perhaps a two to three times greater warming at the poles, would lead to a sea level rise of 25–140 centimetres. A rise in the upper part of this

range would inundate low-lying coastal cities and agricultural areas, and many countries could expect their economic, social, and political structures to be severely disrupted (World Commission on Environment and Development 1987: 148).

The Brundtland Report and the continued gathering of scientific evidence catapulted climate change to the top of the political agenda of many countries at the end of the 1980s. On 23 June 1988—more than thirty years ago!—Dr James Hansen, then director of NASA's Institute for Space Studies, stated in a landmark testimony before the US Senate Energy and Natural Resources Committee, that

[g]lobal warming has reached a level such that we can ascribe with a high degree of confidence a cause-and-effect relationship between the greenhouse effect and observed warming...In my opinion, the greenhouse effect has been detected, and it is changing our climate now (Brulle 2018: online).

Climate change was no longer only a concern for tree-hugging activists—if it ever was confined in that way. Now, NASA scientists and the top political class in the richest countries of the world were not only informed about climate change but were actively talking about what to do about it.

This recognition of the urgency of climate change, and the high risk of not doing anything to turn it around or address its predicted impacts, contributed to the Rio de Janeiro Earth Summit (Rio Summit) in 1992, which brought together leaders from government, business and NGOs from across the world, including most heads of state. At the Rio Summit, the United Nations Framework Convention on Climate Change (UNFCCC)—an official, international environmental treaty with binding obligations—was signed, coming into force in 1994.

The so-called Conference of the Parties (COP) is the UNFCCC's main decision-making body and meets annually. At COP3 in 1997, the Kyoto Protocol was signed, the first international agreement to curb global greenhouse gas emissions. At COP21, in 2015, the landmark Paris Agreement was reached to commit states across the world to keep global warming below 1.5 degrees Celsius.

Alongside these agreements under the UNFCCC, the United Nations has also included 'Climate Action' as one of seventeen global Sustainable Development Goals (SDGs) adopted in 2015, framing

SDG13 specifically as a call that governments “[t]ake urgent action to combat climate change and its impacts”.³

Having arrived at 2021, however, scientific evidence for ongoing global temperature rises alongside industrial combustion of fossil fuels is now overwhelming. The simple graphic shown in Figure 1 communicates clearly where we are in terms of global temperature rises since 1850.

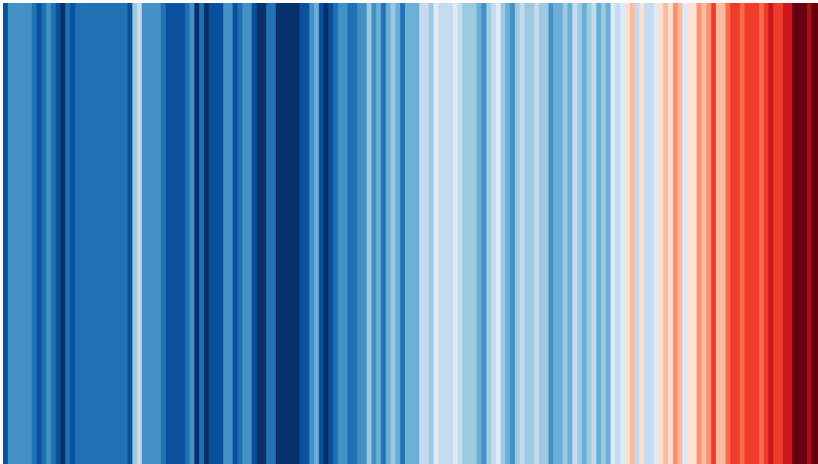


Fig. 1. Annual average temperatures for the world, 1850–2020, based on data by the UK Met Office, Graphics and lead scientist Ed Hawkins, National Centre for Atmospheric Science, University of Reading. Creative Commons, <https://showyourstripes.info/>.

Climate scientists now agree

that 2011–2020 was the warmest decade on record, in a persistent long-term climate change trend. The warmest six years have all been since 2015, with 2016, 2019 and 2020 being the top three. The differences in average global temperatures among the three warmest years—2016, 2019 and 2020—are indistinguishably small. The average global temperature in 2020 was about 14.9°C, 1.2 (± 0.1) °C above the pre-industrial (1850–1900) level (WMO 2021: online).

In other words, we have already seen a 1.2 degrees Celsius temperature rise globally, which makes it all but certain that we will fail to meet the

3 See <https://www.un.org/sustainabledevelopment/climate-change/>.

1.5 degrees commitment made by the UNFCCC's COP21 in Paris in 2015 – as confirmed in the recently published first instalment of the Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC 2021). If current trends persist, and even if countries meet their Paris Agreement obligations, many climate scientists now warn that we are heading towards at least 3 degrees Celsius change compared to pre-industrial levels (UN 2019).

Common but Differentiated Responsibilities?

The UNFCCC treaty agreed in Rio in 1992 clearly acknowledged that the rich, highly developed and industrialised countries have a historical responsibility to take a lead in combating climate change, given that countries such as the UK, the US, France, Germany, etc. have been pumping greenhouse gases at scale into the atmosphere for at least three hundred years. The treaty says in Article 3, Principle 1:

The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof (UN 1992: 9).

The Kyoto Protocol, the first landmark, international agreement to commit to Greenhouse Gas (GHG) reductions, repeated this commitment:

[a]ll Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances (UN 1998: 9).

The key phrase here is 'common but differentiated responsibilities', acknowledging that climate change is a global 'commons' problem (as further discussed in Lankford's chapter, this volume), but that different countries have different responsibilities in relation to their contributions to this problem. Carbon emissions do not respect national borders: if a large, coal-fired power station is built in one country, it ultimately affects the climate on the whole planet. In saying that responsibilities are 'differentiated', Global South countries are acknowledged to have not been the cause of climate change, and to have not emitted massive

amounts of GHG for very long, with the inference that they cannot be expected to sort out the mess that Global North countries—the rich, industrialised nations with their expansionary colonising histories—have caused.

A glance at global history reveals how closely energy and GHG emissions have been linked to both economic growth and colonial expansion. The Netherlands was the first country to develop a taste for exponential industrial growth back in the sixteenth and seventeenth centuries, which would have been unthinkable without the availability of cheap domestic peat, as well as timber from Norwegian and Baltic forests (Moore 2010). One reason that Britain took over Holland's imperial leadership was due to its vast reserves of coal mined at great profit through the use of cheap labour, with the burning of coal taking off at the end of the eighteenth century, and growing exponentially in the nineteenth century (Malm 2016). Then came oil and gas, which have helped make the United States of America the global imperial master from the early twentieth century onwards (Foster 2006).

There is thus more than 250 years of fossil fuel burning by the Global North to account for. Many climate justice activists advocate for some form of reparations to be paid by the North to the poorest countries of the planet, particularly those that are already struggling to adapt to a rapidly changing climate, whether in the form of rising sea levels, increasing drought (as considered in the chapter by Lendelvo and colleagues, this volume), failed harvests, or bigger and more forceful weather events such as storms. The fact that approximately 80% of historical carbon emissions have to be attributed to the rich world (Centre for Global Development 2015), and are already causing havoc in many countries around the world, cannot simply be wished away.

In the Paris Agreement of 2015, 'common and differentiated responsibilities' were again mentioned repeatedly, for example in Article 4, Paragraph 19:

[a]ll Parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies, mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances (UN 2015: 6).

Yet, this principle has gradually been pushed into the background, and the discourse of ‘differentiation’ is now almost a fringe occurrence. The rapid rises of emissions, particularly in China and India, are often cited as reasons for why these fast-industrialising countries now also have to curb their emissions. Clearly, they have their own responsibilities and they need to be held to account: China, in particular, is now the largest GHG emitter by far in the world. Let us bear in mind, however, that India’s carbon emissions per capita are still about a seventh of the figure for the United States (Carbon Brief 2019b), and China’s rapidly rising emissions are to a great extent driven by export-driven industries, producing consumer goods for the rest of the world, particularly the Global North (Yang, Yuantao et al. 2020). If we add up historical *per capita* emissions over the past three hundred years, then China’s carbon emissions—with its vast population—lag far behind those countries that industrialised first (Centre for Global Development 2015).

Western European countries like to portray themselves in green, responsible colours, highlighting that their carbon emissions are significantly lower than the Kyoto baseline of 1990. The UK, for example, which is hosting COP26 in Glasgow in 2021,⁴ frequently and happily declares that “[i]n 2019, total UK greenhouse gas emissions were provisionally 45.2 per cent lower than in 1990” (Department for Business, Energy and Industrial Strategy 2020). What is conveniently forgotten is that the UK’s apparent success in lowering GHG emissions is largely due to the early adoption of gas, which has lower emissions than coal and oil, in the early 1990s, i.e. before Kyoto. There are clearly carbon reduction successes in many Global North countries. The power generation sector in the UK, for example, has now phased out coal almost completely,⁵ which, only four to five decades ago, would have been unthinkable. Renewable energy adoption rates are high in countries such as Germany. Global North governments have made efforts to put their countries on a decisive decarbonisation path with the UK being the first country to legislate for a net zero carbon emissions commitment by 2050. The UK’s Office for National Statistics (ONS) claims there are already signs that there has been a decoupling

4 See <https://ukcop26.org/>.

5 Strangely and controversially, however, the UK government is currently considering to approve the establishment of a new coal mine in Cumbria; see <https://www.bbc.co.uk/news/explainers-56023895>.

of economic growth and GHG emissions in the country (Office for National Statistics 2019), apparently proving that the Environmental Kuznets Curve was right to predict that, as countries grow richer, their negative environmental impact will reduce (see, for example, Grossman and Krueger 1995). The ONS confirms that emissions peaked in 2007, and that the country is on the right path to meet its 2050 net zero commitments.

But there are four controversies that such statistics and resulting political posturing ignore or downplay.

First, most global GHG statistics are still based on the production principle: that is, carbon is counted in the countries where it is emitted (see discussion in Hannis's chapter, this volume). Countries such as the UK, however, are net importers of carbon emissions, as the ONS report rightly points out (Office for National Statistics 2019). If a consumption-based approach to carbon accounting is taken, the UK's national carbon emissions would be significantly higher than officially reported. How much higher is subject to which carbon accounting technique is used. This is also true for most Western European countries as well as the United States, which have seen increasing rates of deindustrialisation over the last two decades with not only jobs but also carbon emissions being offshored to countries of the Global South. In return the Global North receives cheap consumer goods whose embedded carbon emissions are not attributed to itself. Of course, some of the exponential growth in carbon emissions by India and China is also due to increases in home-grown consumption. China apparently now has the largest middle class in the world. If we take a consumption-based view, however, then even China's emissions per capita will not reach the US's current rate for a long time. India lags even further behind.

Second, there are three large sectors that are mostly and conveniently ignored by any carbon accounting techniques: the military, shipping and aviation. As Bigger et al. report in this volume, the US military 'footprint' is higher than many middle-income countries. Calculating the carbon footprint of global military operations is nearly impossible, however, as governments do not report details of military fuel consumption, emissions and impacts. Some analysts estimate that the global 'footprint' of the military could be as high as 6% of global emissions (Scientists for Global Responsibility 2020): bigger than Russia's entire share in 2019. The global shipping and aviation

industries have also repeatedly evaded their climate responsibilities, given that their operations transgress national boundaries. Ships mostly operate outside national jurisdictions, and again an effective calculation of their carbon footprint is difficult. Estimates exist that put shipping and aviation on a combined 5.39% of global GHG emissions (Ritchie 2020; Saul 2020)—higher than the GHG emissions of high emitting countries such as Russia—and both global shipping and aviation emissions are rising fast.

The third area often conveniently forgotten in any national carbon accounting scheme concerns the financing of fossil fuel infrastructure. Large fossil fuel projects, such as the development of new oil and gas fields, or the building of pipelines and dams, requires finance that even national governments cannot muster. The largest banks of the world are also the largest financiers of fossil fuel developments. The Banking on Climate Chaos Report 2021 (Rainforest Action Network 2021) showed that the world's biggest sixty banks have provided \$3.8tn of financing for fossil fuel developments, *since* the Paris Agreement was signed in 2015. JP Morgan Chase, which tops the table, has provided more than \$300bn of finance alone. These global finance streams again distort the national pictures of GHG emissions. Without such finance, oil fields could not be developed nor coal-fired power stations built. But which country should be responsible and accountable for the carbon emissions caused by these new fossil fuel developments? These banks, which are normally headquartered in Global North countries, profit from these projects, creating economic growth activities in the countries they are based in and demonstrating the significant continuing global influence of the fossil fuel industry (as emphasised in Wright and Nyberg's chapter, this volume).

Fourth, but by no means least, we need to account for the fast-rising emissions associated with so-called 'green' industries, such as renewable energy. Biomass-burning power stations, such as the UK's Drax, electric vehicles, industrial-scale wind parks, large solar farms, nuclear power stations—these are all sold as 'low-carbon' solutions to the planet's climate change malaise. Yet, if the GHG emissions of the entire life cycle of these technologies are taken into account, their carbon footprint is significant, particularly in the context of their fast adoption around the world, not to mention their often-forgotten, grave social implications (Sullivan 2013a; Ramirez and Böhm 2021). Dunlap's chapter, this volume, thus proposes that industrial-scale renewable

energy production should more accurately be labelled as ‘Fossil Fuel+’ to acknowledge the continued product-cycle dependence of these technologies on fossil-fuel based sources of energy.

Does the Environmental Kuznets Curve, i.e. the suggestion that beyond a certain degree of economic growth a society will reduce its environmental impacts, account for these four areas of contention? Are the rich, Global North countries really on a path of decarbonisation? Deepening the intractability of reducing CO₂ emissions whilst simultaneously maintaining an industrial growth pathway is the greenwashing that accompanies renewable energy production on an industrial scale. Perhaps only a Fossil Fuel Non-Proliferation Treaty, in which governments commit not to extract and exploit fossil fuels, will ultimately be the kind of governance mechanism that will prevent the exposure of the climate to future fossil fuel emissions—as proposed by Newell, this volume. On this point, it is encouraging to see a recent ruling by a Dutch court that oil giant Royal Dutch Shell must cut 45% of its 2019 greenhouse gas emissions by 2030 so as to contribute to national targets agreed under the Paris Agreement of COP21 (Farmer 2021).

Meanwhile, however, all the global GHG emissions curves go in the wrong direction.

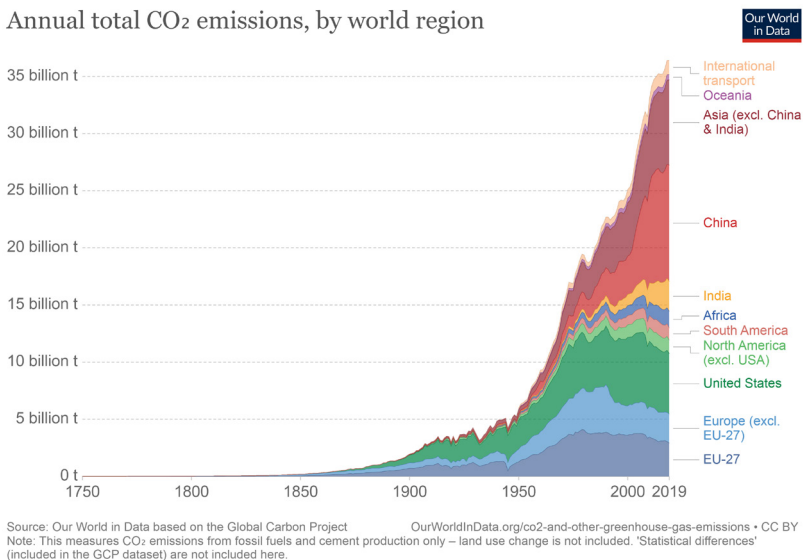


Fig. 2. Annual total CO₂ emissions, by world region, 1750–2019, Creative Commons, <https://ourworldindata.org/grapher/annual-co-emissions-by-region>.

Three Decades of Carbon Fetishism

For three decades now, there has been talk and action on climate change at the highest possible levels—in politics, business, finance and civil society. For three decades, climate change has shaped the consciousness of citizens, consumers, politicians, entrepreneurs, farmers—and particularly those land-based communities directly affected by climate change (see chapters by Dieckmann, Lendelvo et al., and Sullivan this volume). We have seen the rise of climate justice movements, such as Extinction Rebellion (XR)⁶ and Fridays For Future⁷ (as discussed by Gardham, this volume). Swedish environmental activist Greta Thunberg, whose activism began as a school strike in protest against the very limited political action *vis-à-vis* climate change, has been catapulted into a global phenomenon, speaking in front of the UN Assembly and the European Parliament. David Attenborough, the famous UK-based conservationist and broadcaster, has become an outspoken climate activist, producing advocacy films on the dangers of climate change shown around the world on platforms such as Netflix. Thousands of parliaments, local government authorities and other large public organisations around the world have declared Climate Emergencies. Not a day goes by without a large company making ‘net zero’ commitments (although see Dyke et al. and Bailey this volume for more detail regarding the effectiveness or otherwise of net zero policies).

Take, for example, the most recent, annual letter to the CEOs of companies invested in by BlackRock, the asset management company, written by Larry Fink, its founder, chairman and chief executive officer:

I believe that the pandemic has presented such an existential crisis—such a stark reminder of our fragility—that it has driven us to confront the global threat of climate change more forcefully and to consider how, like the pandemic, it will alter our lives (Fink 2021: online).

Fink has committed BlackRock “to supporting the goal of net zero greenhouse gas emissions by 2050 or sooner” (BlackRock 2021: online). While there is very little detail on how this goal is to be achieved, it

6 <https://extinctionrebellion.uk/>.

7 <https://fridaysforfuture.org/>.

nevertheless is remarkable for Fink to become a corporate ‘climate activist’ (Skoglund and Böhm 2020) in a country, the United States, where a significant proportion of the population still believes climate change is a hoax. His commitment is part of a wider trend in the finance industry that is now, apparently, taking environmental, social and governance (ESG) criteria, such as climate change, very seriously (as also analysed by Kaplan and Levy, this volume). As the *Financial Times* says:

Investment in companies that integrate environmental, social and governance factors continues to gain traction across public and private markets. Once considered a niche, the zeitgeist has gone past the notion of a ‘seismic shift’. Instead, integration of ESG underpins most, if not all, debates about the future of the investment industry (Lampen 2021: online).

Sounds good, does it not? All this newly found commitment to tackle climate change as well as the wider environmental malaise we find ourselves in should be welcomed and celebrated. However, a heavy dose of scepticism and critical interrogation is also needed (as offered by Bracking, this volume), precisely because we have been here many times before.

Our outline above suggests that capitalism (and state socialism, for that matter) does not have a good track record in terms of environmental performance. For decades now, it has failed to adequately address the climate crisis (Böhm et al. 2012). Whatever has been tried has not worked. Global GHG emissions are still rising exponentially—as clarified in Figure 2. Most analyses indicate that the global COVID-19 pandemic will only temporarily halt emissions, with a massive rebound looming. This was certainly the case in 2008/09 when the last global crisis meant that GHG reduced slightly in most countries, only to continue on their path of exponential growth soon after.

Why is this? Why, despite all the talk and the good intentions by many, has the world not managed to reduce GHG emissions since the inception of the UNFCCC all those years ago? Why are emissions still rising fast? One answer lies in the carbon market instruments that have been invented over the past thirty years to deal with the climate crisis.

Already at COP3 in Kyoto in 1997, the rich world, led by the US, demanded ‘flexibility’ in terms of how the highly industrialised countries should be allowed to deal with cutting their carbon emissions. This demand resulted in a proliferation of market mechanisms, which, in proper capitalist market fashion, work by establishing property rights for carbon emissions, allowing carbon permits and credits to be traded globally (Böhm and Dhahi 2011; Böhm et al. 2015). The ensuing creation and ‘primitive accumulation’ of carbon units led to a number of Emissions Trading Schemes (ETS) being set up across the world, most prominently the EU-ETS, which came into force in 2005 (Lohmann 2009, 2014).

This market approach is in line with dominant neoliberal governance approaches that have been spearheaded by Anglo-Saxon countries, mainly the US and the UK, since the early 1980s, and which have since spread across the globe ultimately through finance conditionalities set by International Financial Institutions (Dunlap and Sullivan 2019). While states and their governments have not disappeared, the ideological approach by neoliberalism is to let market principles deal with most economic and increasingly social and environmental affairs, including climate change. But the success of ETSs around the world has been limited, to say the least, with only small percentage points of progress made towards reducing global GHG emissions.

A recent paper argues that despite low carbon prices in the EU-ETS, this continent-wide carbon trading scheme was responsible for a 3.8% cut in total EU-wide emissions between 2008 and 2016 (Bayer and Aklin 2020). This calculation can be challenged on various grounds, but even if such a reduction can be robustly attributed to the EU-ETS, such a modest success can hardly be a blueprint for the radical emissions cuts needed for any chance of limiting global climate chaos. Many academics, commentators and climate activists have argued that neoliberal, market-based approaches have been nothing more than a delaying tactic, allowing the big polluting companies and countries to continue to emit carbon at a massive scale, while offsetting their responsibilities through clever carbon accounting techniques (Lippert 2014) and the fantasies of “green success” they sustain (Watt 2021).

Carbon has now become a major commodity, traded on stock exchanges across the world. This financialisation of climate change

is creating new carbon elites, benefitting from the world's quest to urgently curb global GHG emissions and seemingly decarbonise capital (Christophers 2019; Langley et al. 2021). Larry Fink and the other financiers now riding the ESG boom are sniffing gold. When he talks about "capturing opportunities created by the net zero transition" he has carbon pricing mechanisms in mind. Whilst these potentially financial(ising) instruments have been around since Kyoto in 1997, COP21 paved the way for a massive scaling up of voluntary trading of carbon units so as, again seemingly, to meet the urgent climate challenges facing global society today. For this reason,

[a] host of top figures from business, finance and academia led by former Bank of England Governor Mark Carney have announced a global task force to accelerate the development of voluntary carbon markets across the private sector, ahead of anticipated surge in demand for CO2 offsets as the net zero transition gathers pace (Holder 2020: online).

Carney's 'taskforce' aims for "scaling voluntary carbon markets and allowing a global price for carbon to emerge", which is claimed will give companies the "right tools and incentives to reduce emissions at least cost" (ibid.). This new initiative conveniently ignores the problematic evidence and experience of operating carbon markets, and specifically voluntary offsetting schemes, over the past twenty years.

When in 2009, in the run-up to the COP15 climate change talks in Copenhagen, we published the book *Upsetting the Offset* (Böhm and Dabhi 2009), our intention was to show the negative and oft-ignored impacts of carbon offsetting on the ground in the Global South especially. Tamra Gilbertson (2009), for example, in her case of A. T. Biopower, showed how what used to be sustainable agricultural practices in Thailand were transformed into so-called carbon neutral operations that create profits and rents for local elites and international polluters, yet disadvantage local people and communities.

In 2014, one of us (Böhm) co-authored in the journal *Carbon Management* an analysis of evidence for 'Ten reasons why carbon markets will not bring about radical emissions reduction' (Pearse and Böhm 2014). The article argued that carbon markets do not work because they provide plenty of loopholes for the biggest emitters, often going hand-in-hand with a lack of political will to radically curb GHG emissions (see also Bryant et al. 2015). Lobbying by fossil fuel elites is rife and has

resulted in dinosaur industries actually benefiting from the introduction of carbon markets, and there have also been many cases of corruption. Despite their stated commitments to further sustainable development, carbon offsetting schemes, which are normally implemented in Global South countries, often involve a whole range of negative social and environmental ‘side-effects’ not accounted for when ‘net zero’ or ‘carbon neutral’ claims are made by investors in this new imaginary of “carbon earth” (Sullivan 2010: 113; Ehrenstein and Muniesa 2013; Asiyani 2017). Carbon markets can also be regressive in terms of disproportionately affecting low-income households. What the carbon market approach amounts to is an almost blind belief in market mechanisms to solve the climate chaos we find ourselves in. But these carbon mechanisms are so complicated, technocratic, and obscure that they are really designed for use by corporate and financial elites only.

The reality and academic evidence presented in this 2014 paper has not changed. What has changed is that after almost ten years of bear climate markets, the new ESG activists, including Larry Fink, smell an opportunity. Whilst perhaps unintended, what the combined Greta Thunberg and David Attenborough effect has done is reignite the fantasy that carbon markets will solve climate chaos. Fink will always take BlackRock where the future money is. Carbon markets, in the guise of ‘net zero’ strategies, appear to offer this future.

Let us ask some questions in response. In the other, still ongoing, global crisis that is the COVID-19 pandemic, have governments around the world relied on markets to deal with the biggest health crisis the world has seen for a century? Have they created complicated COVID-credits that can be traded on global stock exchanges to determine the most efficient way of combating the virus? Have they allowed COVID-offsetting, so that some people or companies could buy themselves out of lockdown? No? No, they have not! (Although we note the increasing talk of creating and selling so-called ‘Covid bonds’—see Postel-Vinay 2021). This is because there was no time. The pandemic was and is an emergency. Everybody had to go into lockdown, everybody was affected. The virus knew and knows no borders, and the countries that have most successfully dealt with the pandemic are those where there has been decisive government action. It is precisely this kind of political will that has been in short supply for combating climate change (as also observed by Halme and colleagues, this volume).

Carbon offsetting and trading schemes will undoubtedly see unprecedented growth in the coming years, if ESG activists and politicians have their way. Companies and countries will continue to ask for maximum 'flexibility' in meeting their climate commitments, which is code for saying: they want to offset their emissions without cleaning up their act at home.

What all this amounts to is what the critical geographer Erik Swyngedouw (2010) has called 'CO₂ fetishism'. For Swyngedouw, capitalism's attempt to deal with the climate crisis is a perfect example of 'post-politics', generating a lot of talk about what needs to change to make our existence on earth sustainable without changing much at all. What is important to bear in mind, though, is that this talk about change is not all there is. Swyngedouw (2010) also argues that capital attempts to materially reconfigure itself through the crisis of climate change, precisely by turning carbon (nature) into a commodity through putatively *decarbonising* capital, complementing observations of capitalism's reconfiguration through a 'financialisation of nature' deemed to effect nature's care (for example, Bracking 2012, 2019; Sullivan 2012, 2013b).

These innovations make sense as new layers of the commodification processes that have run through capitalism's history. With good reason Jason Moore (2015) calls capital an ecological regime, because it has always mixed human labour with nature's generative capacities so as to produce and reproduce natures in specific ways in particular times and places. Adopting this perspective, we can see how the battle of the twenty-first century is to further transform capital-as-ecology into capital-as-climate. Such abstractions involve immense economic, social, cultural and environmental forces, constituting a process of fetishisation in a Marxian sense, spurred on by the realities of the worsening climate in parallel with the profit and rent opportunities that emerge from this context for elites. Masked by the appearance of the carbon commodity that can be traded, then, are the socio-ecological contexts, calculative practices, and relations of exchange that permit a unit of carbon to assume a monetary value that can be traded.

Many environmentalists have become successful entrepreneurs and many investors are now riding on the ESG bandwagon. This is what capitalism does best. It commodifies, and a new commodity to be formed and traded is carbon. This is nothing else but what Marx (1976) called

'commodity fetishism', the process by which social relations appear as commodity relations. Without this most basic of all abstractions, capital could not appropriate people and things that exist outside its logic, in order to bring them into the workings of the capital machinery. Once appropriated, they are exploited either extensively (extending the time that capital has to work on its subjects) or intensively (squeezing more value from within a given time). And once the basic labour process cannot be more optimised and appropriation becomes too costly, financialisation kicks in. As Moore rightly argues (2015), capitalism is doing all of these three things simultaneously: appropriation, commodification and financialisation. 'Climate capitalism' is no different. It too expands through a unique combination of the exercise of state violence, business opportunity and cultural shifting.

This process of the creation of climate capitalism is not unchallenged of course. What the climate debate has shown is that this capitalisation process is a struggle of forces within capital and associated social actors themselves, as foregrounded in the chapters by Mannan and colleagues, North, Paterson and Bond, this volume. It is not something that is somehow masterminded by an evil force, placed in Washington, D.C. or London or even Beijing. It emerges out of the contradictions of capital, the outcomes of which are not predictable.

The latter observation also means that the commodity fetishisation of carbon is by no means an inevitable process. Given that capitalist processes can only deal with such a grave challenge as climate change through new layers of commodification that disenfranchise and dispossess people from other modes of production, conditions are also created that invite contestation and the expression of different concerns. The uneven, unequal and highly volatile process of climate capitalisation, which elites try to control, cannot help but engender resistance and greater consciousness of justice concerns (as considered in the chapter by Harris, this volume). Climate justice is not something that should somehow come after an acceptance of climate capitalism. A properly just response to climate change can only be brought about if we do not shy away from questioning the fundamental logic of carbon fetishism and the logic of the market that attempts to appropriate, commodify and financialise nature, and ourselves.

Purpose and Scope

We intend this book to fill a gap in the climate change debate, which is normally dominated by environmental, climate and natural science perspectives. This volume instead comprises twenty-eight short interventions by prominent social scientists and humanities scholars of climate change and societal responses, as well as emerging academic contributors and voices from climate activism, bearing in mind that these categories are not mutually exclusive. Contributors to the volume come from many parts of the world and share their perspectives both on what is important in climate change debates, and ‘what is to be done’ in terms of radical climate action.

The collection includes new essays as well as republished texts, organised around seven themes: paradigms; what counts?; extraction; dispatches from a climate change frontline country; governance; finance; and action(s). These themes, which we outline briefly below, emerged from our reading of the contributions submitted for the collection, rather than being established in advance. They thus seem salient as a representation of climate change concerns consolidating amongst social science and humanities scholars and activists.

Paradigms

The first section on **Paradigms** is comprised of contributions that address broad perspectives arising in climate change debates. These ‘big-picture’ essays introduce some key challenges of the climate crisis in terms of societal understanding and response.

The opening chapter in this section, titled ‘One Earth, Many Futures, No Destination’, is by geographer Mike Hulme, whose work is widely known for its critical engagement with how climate-change as an *idea* becomes deployed, mobilised and disagreed about in public, scientific and policy discourse: most recently in *Climate Change: Key Ideas in Geography* (Hulme 2021). Hulme observes that since the first Earth Day, more than half a century ago, it has become clear that it is easier to generate scientific insight into the ways human systems and behaviours are altering the planet than it is to redirect those human systems to lessen the planetary impacts predicted through scientific insight. Alongside other chapters in this volume, Hulme thus emphasises the significance

of divergent human values for the possibility of making choices that redirect human systems such that their planetary impact is transformed.

The chapter that follows, by Minna Halme and colleagues on the Finnish Expert Panel on Sustainable Development, foregrounds how the COVID-19 pandemic has laid bare the vulnerability to crises such as climate change caused by a current global socio-economic system oriented towards short-term financial efficiency. 'From Efficiency to Resilience: Systemic Change towards Sustainability after the COVID-19 Pandemic' argues that sustainability at scale can only be effected through a replacement of the dominant efficiency paradigm with a resilience paradigm. Their chapter outlines key orientations towards sectoral planning and governance they consider necessary for society to walk a path that effects systemic transformation towards resilience, understood as a mutually supportive symbiosis of social and natural—socio-natural—'systems'.

The section on paradigms closes with Sian Sullivan's chapter 'On Climate Change Ontologies and the Spirit(s) of Oil', which considers ontological dimensions at play in societal understandings of the causes and implications of climate change. She asks questions of how anthropogenic climate change is understood culturally, and of what responses may be promoted as appropriate for this systemic predicament. By gesturing to culturally-inflected differences in ways of seeing and knowing the world, she draws into focus the interplay of multiple realities in climate change understandings that may contribute to political disagreements around highly divergent values and worldviews.

What Counts?

In considering divergence in climate change understandings and responses, our first section leads clearly to the question of **What Counts?** in climate change management, as asked in the essays pursuing this second theme of the book. This section addresses issues of calculation and measurement, given that climate change debates are often about numbers, particularly in relation to emissions of GHG. A key aim of the contributions here is to look behind the numbers, providing a rationale

for why processes of calculation and measurement should also always be seen as political and hence as open to contestation.

James Dyke and co-authors kick off the section with an essay provocatively titled 'Why Net Zero Policies Do More Harm than Good'. The policy idea and ideal of 'net zero carbon', i.e. that socio-economic activity should generate zero carbon emissions in aggregate, is important for a number of subsequent chapters in this book because it has been so definitive in proposing a route towards a 'solution' for managing CO₂ emissions globally. As Dyke and colleagues argue, however, 'net zero' discourse conceals and justifies the deployment of highly speculative technologies that pose 'fairytales' in terms of their CO₂ emissions reductions, whilst also nudging society on to a series of potentially dangerous technological pathways for which outcomes are unknown. They confirm instead that the only way to keep humanity safe is through immediate and sustained radical cuts to greenhouse gas emissions, acknowledging the simultaneous challenge of doing this in ways that are socially just so as to redress, rather than deepen, the inequalities bound up with uneven industrialisation endeavours.

In 'The Carbon Bootprint of the US Military and Prospects for a Safer Climate', Patrick Bigger and colleagues continue by asking searching questions of high-tech responses to CO₂ emissions reductions in one of the most impactful of global industries, namely the US military. They foreground how future military CO₂ emissions are locked into the US military's expansive and coupled global logistical networks, hardware, and interventionist foreign policy. Echoing Dyke et al.'s chapter, they argue that apparently well-intentioned calls to 'green' the military are insufficient to reign in military emissions, urging that for climate change management alone the scope of the US military must be dramatically scaled back as part of any serious initiative to maintain a safer climate.

David Durand-Delacre and his team of co-authors shift focus in the following chapter to modes of counting and their implications when directed towards the understanding and management of human dimensions of climate change, specifically human migration linked with climate change. 'Climate Migration is about People, not Numbers' examines the large numbers often invoked to underline alarming climate migration narratives, and outlines the serious methodological limitations linked with the production of these numbers. In arguing for a greater

diversity of knowledges of climate migration and emphasising the value of qualitative and mixed methods in research, they also question the usefulness of excessively inflated numbers to progressive agendas for climate action, given the xenophobic fear of climate migration promoted by such numbers. In short, they emphasise how decisions based on meeting quantitative targets around migration reduction should be refocused instead on peoples' needs, rights and freedoms, and that understanding these dimensions of human experience requires a mode of listening that does not reduce humans to statistical datapoints alone.

'We'll Always Have Paris' by Mike Hannis turns to the implications of the provision for voluntary carbon trading in Article 6 of COP21's Paris Agreement, considering how this can be robustly counted in practice so as to ensure the elusive goal of global 'net zero' CO₂ emissions. Turning a sceptical eye to theoretical carbon trading, fantastical Negative Emission Technologies (NETs), and voluntary national 'contributions', Hannis asks questions of how Nationally Determined Contributions (NDCs) to global CO₂ emissions are calculated across the complexities posed by voluntary carbon trading possibilities. In placing COP21's Article 6 in the context of the internationalist spirit of 2015 that at least consolidated the idea and impression of a globally coordinated effort, he additionally asks what impact the resurgent nationalism of the years since may have on NDC calculations. Will the new Democrat US presidency be able to re-establish US climate leadership and move negotiations back towards a position of constructive international engagement on climate issues and the NDCs on which emissions reductions rest? How might COP26 provide a boost to morale in internationalist spirit around climate change governance?

Bruce Lankford's closing chapter in this second section of the book considers how CO₂ is conceptualised and counted in what he frames as 'The Atmospheric Carbon Commons in Transition'. In his analysis Lankford brings to bear the rich concept of "paracommons", as the "commons of material salvages" currently arising from the context of climate change crisis requiring that emitted CO₂ is systemically retrieved or 'salvaged'. Drawing on analyses of resource commons, he argues that the carbon/atmospheric commons can be framed in three consecutive stages: a "sink-type atmospheric commons" occurring prior to the 1980/90s; a "husbandry-type carbon commons" lasting from the 1980/90s to 2030s; and an emergency "carbon paracommons"

post-2030s. The first stage sees the atmosphere treated as a dump or sink for carbon dioxide (CO₂) 'waste' resulting in rising CO₂ levels. The second stage sees climate change mitigation (e.g. carbon sequestration in forests) as an Ostromian-commons husbandry that attempts to reduce CO₂ emission rates but continues to result in levels remaining above 400 ppm. In the third stage being entered now, the "carbon paracommons" treats CO₂ and its 'salvaging' as a matter of urgency, requiring methods of permanent sequestration, non-use and transformation, amidst uncertainty as to how in practice these may be instituted and with what implications.

Extraction

Given that climate change is caused by the extraction and transformation of fossil fuels, the third theme of our book coalesces around **Extraction**. This section is comprised of contributions that critically reflect on our uneven addiction to fossil fuel extraction and ask whether the brave new world of the nascent renewable energy transition is set to be any more sustainable.

In 'The Mobilisation of Extractivism: The Social and Political Influence of the Fossil Fuel Industry', Christopher Wright and Daniel Nyberg highlight a key paradox: although the worsening climate crisis has led to growing social and political demands for meaningful climate action and the decarbonisation of economies, the modern global economy is defined by fossil fuel energy and its embedded legacy of two centuries of economic growth and development. They outline how the fossil fuel industry has defined the global economy and defended its position as the most powerful industry in the world. This context means that assumptions of corporate self-regulation as the logical response to the climate crisis will allow for the continuation of a 'business as usual' approach in which fossil fuel energy is maintained. They argue that an emphasis on corporate self-regulation deliberately ignores the urgent need for government regulation of carbon emissions. Worse, they foreground how current corporate responses to the climate crisis rely on a politics of 'predatory delay', wherein the fossil fuel industry cynically seeks to slow the process of decarbonisation to maximise their financial returns in the short term, whilst simultaneously appearing as concerned corporate citizens.

'End the "Green" Delusions: Industrial-Scale Renewable Energy is Fossil Fuel+', by Alexander Dunlap, matches this concern, arguing that industrial-scale renewable energy does little to remake exploitative relationships with the earth. In representing the renewal and expansion of the present capitalist order, particularly given the fossil fuels embedded in the making of these technologies, Dunlap considers instead that industrial-scale renewable energy production should be more accurately understood as "fossil fuel+". He urges a radical re-thinking of the socio-ecological reality of so-called renewable energy so as to create space for the step-change of strategies needed to mitigate and avoid climate and ecological catastrophe.

In 'I'm Sian, and I'm a Fossil Fuel Addict: On Paradox, Disavowal and (Im)Possibility in Changing Climate Change', Sian Sullivan draws on research with people who have known lives not determined by access to fossil fuels to face the reality of being completely personally dependent on fossil fuel extraction and the products made possible by fossil fuels. Her essay is an attempt to fully face the contradiction between maintaining hope for binding international climate agreements that have teeth, whilst being aware of her dependence on the fossil fuel extracting and emissions-spewing industrial juggernaut that permeates all our lives. Drawing critically on twelve-steps thinking and psychoanalytic literature, the chapter constitutes a reflection on fossil fuel addiction, highlighting the destructive paradox of not being able to live up to internalised but unreachable values regarding environmental care in a fossil-fuelled world.

Dispatches from a Climate Change Frontline Country— Namibia, Southern Africa

The fourth section of the volume changes tack to focus in on dimensions of climate change impacts and understanding for a single country at great risk of small systemic changes in climate parameters. In recognising that climate change debates are dominated and even colonised by perspectives from the Global North, **Dispatches from a Climate Change Frontline Country—Namibia, Southern Africa**, comprises contributions from and about one country with heightened potential vulnerability to small changes in climate due to its status as an

arid or semi-arid 'Global South' country. These chapters are set against the background of amplified risk of climate change posed by present oil exploration in Namibia's north-east Kavango Region, bordering Botswana, and current frenzied excitement within the oil industry that Namibia might "become the biggest oil story of the decade" (Leigh 2021), although the essays here do not explicitly address this rapidly shifting situation. The section builds on long-term research collaborations in Namibia by one of us (Sullivan).⁸

Selma Lendelvo and colleagues in the opening chapter for this section draw attention to a specific set of climate change-related interactions that pose particular implications for women in some rural areas of Namibia. 'Gendered Climate Change-Induced Human-Wildlife Conflicts amidst COVID-19 in Erongo Region, Namibia' argues that the risks of climate change for drier countries have become more pronounced, with small increments in temperature changes considered to pose serious consequences for dry countries such as Namibia and neighbouring Botswana, both of which have experienced significant and sustained drought in recent years. Lendelvo and co-authors draw attention to one effect of such changes, namely the amplified intensity of interactions between people and wildlife, such as elephants, as drought in the drylands of west Namibia concentrates humans and wildlife around available water sources. They focus on some of the particular implications for women as a vulnerable social group that is bearing the brunt of climate change-induced 'human-wildlife conflict', and foreground how women here are adjusting to these pressures. In closing, Lendelvo and colleagues ask us to remember that climate change impacts are differentiated and that the most vulnerable social groups—women, the poor and others—tend not to be present at international round-table discussions such as COPs to share their experiences of dealing and living with the impacts of climate change in their daily lives. Their chapter is intended as a short communiqué to foreground the types of concerns

8 We gratefully acknowledge here two research grants that have supported this international collaboration with Namibian researchers and contexts: Future Pasts (www.futurepasts.net, supported by the UK's Arts and Humanities Research Council (AHRC), and Etosha-Kunene Histories (www.etosha-kunene-histories.net) supported by the AHRC and the German Research Foundation (DFG).

women in rural dryland communities might wish to voice if they were able to be present at COP26.

Rick Rohde and colleagues follow with 'Environmental Change in Namibia: Land-Use Impacts and Climate Change as Revealed by Repeat Photography', a chapter that draws attention to a specific environmental history methodology for understanding environmental change within a recent historical timeline. They demonstrate how repeat landscape photography can be used to explore and juxtapose different cultural and scientific understandings of environmental change and sustainability in west Namibia. Change in the landscape ecology of western and central Namibia over the last 140 years has been investigated using archival landscape photographs located and re-photographed or 'matched' with recent photographs. Each set of matched images for a site provides a powerful visual statement of change and/or stability that can assist with understanding present circumstances in specific places. Sometimes these image sets show trajectories of vegetation change that diverge from modelled climate change projections and scenarios, demonstrating the importance of drawing on multiple sources of information to contextualise, and perhaps complexify, projected and predicted environmental futures.

In 'On Climate and the Risk of Onto-Epistemological Chainsaw Massacres: A Study on Climate Change and Indigenous People in Namibia Revisited', Ute Dieckmann asks searching questions of what may be lost in the process of trying to translate indigenous environmental knowledges and experiences into internationally acknowledged scientific frameworks. She revisits a commissioned World Bank Trust Fund study on climate change and indigenous people in Namibia in which she was involved, to highlight the predicament of short-term 'participatory' research with indigenous communities on climate change, and the ways in which imposed conceptual frameworks may act to subordinate indigenous peoples' ontologies to 'western' ontologies. She reflects that the 'compartmentalising' necessitated by such a methodology risks losing the most important aspects of indigenous ecological knowledge related to climate change, thereby perpetuating both climate and epistemic injustices.

Governance

The fifth theme on **Governance** steps back into a 'wide-angle' view, emphasising that the failure to address global climate change so far has been a failure of governance at global and national levels. Contributions in this section reflect on this governance failure and outline a series of practical solutions for moving forwards, beyond COP26.

The section opens with 'Towards a Fossil Fuel Treaty' by Peter Newell, a clarion call for a new approach for tackling climate change that focuses explicitly on fossil fuels. Like Wright and Nyberg, Newell also highlights the power of fossil fuel lobbies to delay effective climate action, urging that it is time to reign in the power these actors have over our collective fate, through international agreements and laws which effectively and fairly leave large swathes of remaining fossil fuels in the ground. He proposes a *Fossil Fuel Non-Proliferation Treaty* (FF-NPT) based, like the Nuclear Non-Proliferation Treaty, on the three pillars of non-proliferation, disarmament and peaceful use, as an instrument of international governance that could fulfil this purpose.

In 'How Governments React to Climate Change: An Interview with the Political Theorists Joel Wainwright and Geoff Mann' by Isaac Chotiner, we republish an interview with leading theorists of climate change governance that considers how to approach the global politics of climate change. Their conversation foregrounds several different potential futures for our warming planet. They argue that a more forceful international order, or "Climate Leviathan", is emerging, but warn that this configuration remains unlikely to mitigate catastrophic warming.

'Inside Out COPs: Turning Climate Negotiations Upside Down' by Shahrin Mannan and colleagues highlights the complexities of negotiations by the Conference of Parties (COP), observing that COP25, the longest in history, did not achieve its intended outcomes. Government negotiators failed to agree on core issues meaning that implementation of the Paris Agreement (COP21) has been pushed further away. COP negotiations tend to be dragged into overtime and appear inefficient, a perspective not helped by the arcane language of the adopted texts. The chapter advocates for the entire negotiating process to be rethought: through the alternative concept of 'inside out' COPs, wherein actions

on the ground to implement the Paris Agreement are given greater prominence than political negotiations around a patchwork of compromises for implementation. They affirm that many different actors, including civil society, private companies, cities, universities, indigenous communities, young people and others pressing for action, should be placed centre-stage in devising and delivering outcomes that may be more real than those spun in COP Agreement texts run through with constructed ambiguities.

Shifting towards governance by national governments, in ‘Local Net Zero Emissions Plans: How Can National Governments Help?’ Ian Bailey clarifies the support needed from national governments in order that local government bodies can act on urban and regional initiatives that catalyse capacity building, knowledge exchange, and practical action on climate change and other sustainability issues. Bailey affirms that while local government initiatives equally should not be viewed as a substitute for robust international and national action on climate change, they can provide important arenas for mobilising local actors, formulating policies and developing institutions to complement national strategies. This chapter examines three main areas where support from central governments for local climate change responses is needed: the creation of supportive national policy environments; ensuring local governments are enabled to exercise their delegated powers to influence emissions; and the provision of finance to support emissions-reduction activities.

In the final chapter for this section on governance, Paul Harris foregrounds relationships between global climate governance and climate justice. ‘Reversing the Failures of Climate Governance: Radical Action for Climate Justice’ again recognises that global governance of climate change has failed. Emissions of the greenhouse gas pollution that causes climate change are still *increasing* globally, and little has been done to help the most vulnerable communities adapt to the inevitable, potentially existential, impacts. Harris argues that radical action is needed to avert and cope with the most dangerous consequences of climate change but will require focused attention on identifying the most vital sources of failure in climate governance and overcoming them. He suggests that much, if not most, of the failure of climate governance can be attributed to a lack of multiple kinds of climate justice—a lack of ecological and environmental justice, a lack of social and distributive

justice, and a lack of international and global justice—and that averting climate catastrophe will require governance practices that embrace and implement all forms of climate justice.

Finance

Extending the theme of governance, our sixth section on **Finance** consists of two incisive essays regarding the complex roles of finance in climate change governance. Financing climate change mitigation and adaptation will be arguably a much bigger undertaking than what has been witnessed so far in terms of the global response to the COVID-19 pandemic. The financial resources needed to combat climate change are considered to be immense and the climate finance industry has been growing steadily over the past twenty years. As clarified by the chapters in this section, however, this growth does not in itself demonstrate success in terms of climate change management. The question of how to design and institute sustainable climate finance futures that are also equitable remains. Is it possible to do this in a capitalist global economy that tends towards the concentration of financial(ised) assets, and the fetishised concealment of multiple contradictions?

Sarah Bracking's opening chapter in this section grapples head-on with these contradictions. 'Climate Finance and the Promise of Fake Solutions to Climate Change' illuminates how promises of money from global institutions and governments have financialised people's hopes and expectations of government action to adapt to climate change and slow the emission of greenhouse gases. Bracking asserts that the cultural power of money in our understanding of the world means that climate finance has had the particular effect of signifying action while delivering very little. She argues that moving forwards with the actual material changes to energy, infrastructure, production and income distribution lying at the heart of an effective response to climate change will require acceptance that largely fictional promises of money that "can change things" are a phantasmagorical expression of meaning acting as a "firewall" that prevents real change. The essay traces the small disbursement figures for the main pots of climate finance. In doing so, Bracking offers a stringent critique of the obfuscating power of the language of finance and its propositions in the financing of climate change governance.

Rami Kaplan and David Levy's chapter on 'The Promise and Peril of Financialised Climate Governance' emphasises the rise of investor-driven, "financialised governance" of corporate practices in relation to the natural environment. Investors and investment managers are demonstrating greater concern that the value of assets, from stock markets to real estate, is increasingly subject to climate risks. Financialised climate governance (FCG) puts investors and fund managers at the centre of efforts to limit greenhouse gas emissions, which suggests both the promise and peril of this advanced form of "climate capitalism". They describe these developments and point towards the peril that relying on investors and business self-interest is unlikely to result in the rapid structural shifts needed for full decarbonisation.

Action(s)

The volume's final section on **Action(s)** extends the practical and affirmative suggestions made elsewhere in the book to foreground specific proposals for negotiating responses that are both effective and equitable in addressing and averting the climate crisis.

Peter North's opening question 'What Is to Be Done to Save the Planet?' is a good place to start. The essay reviews the impacts of radical social movement activity on the climate based on observations over the past fifteen years or so. It considers experiences of grassroots prefiguration and experimentation such as transition initiatives, experiments for eco-localisation, and small business networks, contrasting these initiatives with more antagonistic, direct, action-based movements such as the climate camps, mobilisations around the COPs and Extinction Rebellion. The intervention concludes by discussing the perceived efficacy of these varied movements, suggesting a need for more strategic action to effect system change via a 'Green New Deal'.

In 'Climate Politics between Conflict and Complexity', Matthew Paterson similarly foregrounds how climate politics needs both moments of sharp, highly politicising, even over-simplifying moves to keep pressure up, but at the same time a sort of patient, careful attention to the complexity of socio-technical systems to work out how to generate radical shifts in infrastructure and practice. He observes that these different logics are in tension: the post-political/agonistic logic can reduce to slogans and deflect from how society may become

decarbonised in practical terms; the observance of how to effect change through complex socio-technical systems can culminate in technocratic projects. Paterson's chapter navigates the question of how to keep both these logics and their affirmative engagements alive in political praxis linked with climate change.

Rebecca Sandover's chapter on 'Sustainable Foodscapes: Hybrid Food Networks Creating Food Change' connects food production practices specifically with climate change governance, asserting that food matters, from modes of production to global supply chains, to what we eat and how we address food waste. Considering that Agriculture, Forestry and Other Land Use (AFOLU) activities account for some 21–37% of total net anthropogenic GHG emissions it is clear that food practices shape not only climate and ecological breakdown but also human health and well-being including within our food producing communities, and in issues associated with unequal access to food, food justice and animal welfare. Sandover's chapter foregrounds in particular how place-based community groups have been self-organising and connecting with different national organisations whose campaigns overlap to form hybrid food networks, in the midst of a present food policy vacuum in England. It explores the dynamic potential of these hybrid networks in working towards place-based sustainable food solutions through a case study of Devon.

In 'Telling the "Truth": Communication of the Climate Protest Agenda in the UK Legacy Media', Sharon Gardham draws on the results of a thematic discourse analysis of UK media coverage of climate strike actions that took place in 2019, reflecting on the importance for the wider adoption of climate protest messages of how protester claims-making and identity are framed. Gardham's chapter revisits a key question for the organisers of such protests regarding how they can overcome the potential conflict between ensuring their actions pass the test of newsworthiness required to ensure media attention, without failing the tests of claims-making legitimisation necessary for an issue to become accepted as a societal problem that requires urgent resolution.

Picking up themes considered elsewhere in the volume regarding climate justice, Patrick Bond, in 'Climate Justice Advocacy: Strategic choices for Glasgow and Beyond', urges "non-reformist reforms" in climate action. He critiques the lack of ambition and action in the main UN processes, but also critically analyses the 'Glasgow Agreement'

promoted by leading civil society activist groups. Drawing parallels with South Africa's resistance strategies to defeat apartheid, he calls for climate justice movements to similarly not cave in to the internal logic of the climate governance system, instead confronting its core dynamics by delegitimising the system of oppression on which it is overlain. What we need, instead, he argues, is to give confidence to critical ideas and social forces that can question climate capitalism wholesale.

In the penultimate chapter of the book, Lorraine Whitmarsh reviews 'Public Engagement with Radical Climate Change Action', arguing that it is a mistake to understand people's role only in terms of their actions as consumers of apparently low-carbon products and urging that it is critical that people are also engaged as political, social and professional actors to achieve the scale of societal transformation needed. Whitmarsh discusses the varied roles the public can play in decision-making and in taking rapid and radical climate action, their current levels of engagement with climate change, and how to foster further public action. She lands her chapter on a positive note: affirming that we have a unique opportunity now to build back society post-COVID-19 in a way that might lock in low-carbon habits created during the pandemic, and that builds on the growing social mandate for bold policy action to support sustainable lifestyles.

We close this collection with a republished intervention by artist-activists Isabelle Fremeaux and Jay Jordan. Their text clarifies—with poetic and gritty integrity—their choice to publicly refuse participation in an event (*Agir Pour le Vivant / Action for the Living*, in Arles in France, August 2020) on the grounds of the dissonance between the event's intentions and its sponsorship by a series of fossil fuel extractors and financiers. 'Five Questions whilst Walking' invites consideration of the sorts of choices that need to be made if we are collectively to walk away from the forces propelling global climate crisis.

Clearly, no book could be completely comprehensive regarding climate change, the multifaceted challenges it poses, and societal responses to these challenges. This book is rather posed as an intervention, collecting together indicative contributions regarding what social scientists, humanities scholars and climate activists around the world think needs

to be done in terms of both understanding why climate action has failed to dramatically reduce emissions to date, and proposing some routes towards radical climate change action now. That is, the book is intended to provide an affirmative set of ideas about what is to be done and how it can be done, to bring about radical climate change governance so that we have a chance of avoiding runaway climate change.

We are publishing this collection of essays in the months leading up to the high-profile and eagerly awaited COP26 UN climate change conference, due to take place in Glasgow (Scotland, UK) in November 2021. At this conference, all the major stakeholders of the global climate change negotiation process will be present, including heads of state, large national government delegations, policy advisers, NGO and social movement activists, multinational corporations, industry associations, and inter-governmental institutions. There will be significant media interest in COP26, reaching millions of people around the world, linked, for example, with the re-entering of the agreement by the US, the newly entwined crises of COVID-19 and climate change, and negotiations around the form and content of Green New Deal proposals. We hope that this collection of essays will contribute to this discussion.

Despite more than thirty years of high-level, global talks on climate change, we are still seeing emissions rising dramatically around the world. Whatever we have done on this planet in terms of climate mitigation over the past thirty plus years has not worked. Given that most climate scientists believe we are soon running out of time, the authors contributing to this volume ask what has gone wrong and what now needs to be done. We hope the essays collated here will help us move more radically and urgently in the direction needed.

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