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CHAPTER 1

DARK CLOUDS: REGULATORY POSSIBILITIES

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Tomorrow belongs to the people who prepare for it today.

African Proverb

This book arises at a time when our skies are dark, and are becoming darker. There is now irrefutable evidence that the temperate era of the last 12, 000 years, the Holocene era, is drawing to a close. We are moving towards a series of tipping points that could well bring an end to the nurturing 'ecological assemblages' (Trisos, Merow and Pigot, 2020) and Schumacher's (1973) 'natural capital', which provided humans and many other species with the provision of essential 'ecosystem services' (Farber et al., 2002). During this now vanishing era the earth has been characterised by what Rockström et al. (2009: 1) have termed 'planetary boundaries' that provide a 'safe operating space for humanity'.

The warning that these dark clouds carry with them is that we humans have been, especially since we have begun living in industrial societies, systematically destroying the very basis of our existence – an engagement that Brisman and South (2018) compare with self-cannibalism, autosarcophagy. This autosarcophagy has been, and remains, the consequence of carbon intensive economies -- ways of being, built on fire and the heat it produces (Hartmann, 1999).

Hidden in these dark clouds is the spectre of collapse (Diamond, 2005), a collapse that, as Umair Haque (2019) has recently argued, emerges from the bottom up. This is a collapse of the biospheric foundations (see also Smil, 2002), upon which humans, as biophysical and social creatures, depend for their existence and upon which they have built their worlds. Yet, despite this complete dependence on these foundations, humans have collectively paid very little, if any, attention to them. The consequences in this 'age of collapse', according to Hague (2019), is that 'the bottom [is] depleted, which causes the middle to implode, which takes the top away with it, too'.

Back in 2017, as we began planning this volume, we settled on the term 'harmscapes' to conceptualise the evolution of arrays of intersecting and interacting harms. Climate change is a primary exemplar (Berg and Shearing, 2018: 75): a globally coherent phenomenon that creates myriad diverse harms, manifesting in multiple and connected ways. Climate change harms play out at multiple spatial and temporal scales: spatially, harms range from localised to global scales, and temporally, some harms are immediate, others are delayed, and others again are, from any meaningful human perspective, effectively permanent. Climate change is a change process characterised by nonlinear dynamics and threshold effects: as such, impacts can cascade across sectors, and with limited predictability (Duit and Galaz, 2008). The impacts of climate change are dispersed, but uneven. And as with impacts, attribution of climate change, primarily through anthropogenic fossil fuel emissions, is also dispersed and uneven.

Fossil fuels have provided great benefits for contemporary societies, as well as significant costs: as Mitchell notes, '[f]ossil fuels helped create both the possibility of twentieth-century democracy and its limits' (Mitchell, 2009: 399). As such climate change presents a profound challenge to regulatory approaches and frameworks, and one that we use harmscapes to accentuate.

Warnings about climate change, and other environmental catastrophes, that are today at the forefront our existence, are not new. Indeed, as Bonneuil and Fressoz (2016) have recently spelt out so clearly, they have been articulated for centuries. But they have fallen on deaf ears. Virtually no one has listened. And this remains broadly true today although these warnings are clearer and louder than ever. Rather than heed these increasingly clear warnings of our dark clouds, many political and economic leaders, as they have for some time, continue to treat these very pointed warnings, by the very constituency that has enabled our industrial societies to emerge, namely, scientists, as the alarmist cries of 'Chicken Littles'. making absurd claims that the 'sky is falling' when only an acorn has fallen.

Fortunately, responses and action have begun to emerge and accelerate – for example, varieties of international and domestic environmental laws, regional and state-led reforms, along with civil society litigation against states and companies, and business-led reforms (Dahlmann et al., 2020; Hamann et al., 2020). At the same time, many of today's political and economic leaders across the world, the current president of the United State of America provides perhaps the prime example, continue to claim that the sky has not changed and that it has most certainly not fallen and that it will not fall any time soon. It is this attitude of fundamental neglect of the foundational nature of ecosystem services that has driven, and continues to drive, contemporary economies – embraced by businesses both big and small. This attitude is finally being challenged by some, including investment focused businesses – the focus in this volume – by rethinking their foundational dependencies and incorporating this into wider conception of purpose; what Dahlmann et al. (2020) term 'purpose ecosystem'.

The essays in this volume explore the response of businesses to climate change, with a particular focus on the insurance industry and the broader finance industry, industries whose existence is central to the global economy but who had (bar concerns over corporate social licence) historically stayed outside of climate and environmental interventions. It is true that criminology and its green variants have extensively critiqued corporate activities that harm the environment and people (see generally Brisman and South, 2020: 19). However, there is value, we argue, in extending our focus beyond established boundaries and traditional institutions of criminal justice to consider the potential of these private auspices and providers of security (see Brisman and South, 2020: 19). A core reason for our focus is that

the finance sector occupies a 'fulcrum position': if it chooses to act in response to the dark warning clouds it would likely trigger a cascade of activity that could, in short order, bring about an enormous and crucial reshaping shift in the earth system, which might just provide sufficient mitigation to avoid the emergence of a sixth extinction.

At least two drivers are spurring the finance industry to begin to act. First, under Article 2 of the Paris Agreement, the financial sector was championed by the global community as having a central role in enabling the transition to an environmentally sustainable economy in line with global climate targets, and in building global financial resilience to environmental risks (Grünewald, 2020). Vast amounts of finance for climate action was said to be needed to solve climate challenges: finance that only the private sector has the wherewithal to provide (Gunningham, this volume). But scaling up climate finance – for low-carbon infrastructure, renewable energy, energy efficiency and other mitigation measures –involved transforming a finance sector that had only just begun its journey towards sustainability. This led to calls for a 'quiet revolution' (UNEP, 2015; Gunningham, this volume), led partly by financial market regulation and regulators who recognised 'a need for collective leadership and globally coordinated action' (NGFS, 2019: 4).

As this quiet revolution began, business leaders recognised the financial risks of climate change, both physical and transitional in nature (Grünewald, 2020). Directly threatened by the emergence of very tangible and costly impacts of post-Holocene earth system changes, insurance and finance industry leaders, most notably perhaps Carney, the former Governor of the Bank of England, sounded loud and shrill calls for change.

> The stakes are undoubtedly high, but the commitment of all actors in the financial system to act will help avoid a climate-driven 'Minsky moment' – the term we use to refer to a sudden collapse in asset prices…There is a need for [action] to achieve net zero emissions, but actually it comes at a time when there is a need for a big increase in investment globally to accelerate the pace of global growth, to help get global interest rates up, to get us out of this low-growth, low-interest-rate trap we are in…I don't normally quote bankers, but James Gorman, who is the CEO of Morgan Stanley, said the other day: "If we don't have a planet, we're not going to have a very good financial system." Ultimately, that is true. (Carney, quoted in Carrington, 2019)

Perhaps recognising that they 'can't wish away systemic risks', and that 'in the end, a small investment up front can save a tremendous cost down the road' (Carney, quoted in Gill,

2020) the financial and insurance industry have been motivated to change. By 2020 the 'quiet revolution' in climate finance was in fact no longer quiet or niche, but defined by an explosion of sustainable finance-related tools and initiatives driven by private banks, other finance actors and public and private partnerships (Mancini and Van Acker, 2020: 10). There are now more than 390 policy and regulatory climate finance measures implemented at national, sub-national, and regional levels (Mancini and Van Acker, 2020: 25).

These developments, albeit briefly covered here, reveal an emerging practice of finance and insurance businesses as governors of global environmental security, a fact that led us to pursue this book on Criminology and Climate.

Criminology, climate change and the role of private securities

In the global climate change context, criminology is arguably at a crossroads. Globally, we are beginning to rethink safety and security in biophysical terms, which poses a challenge for criminology as an area of enquiry whose fundamental topic has been safety and security (Shearing, 2015). Recognising that security itself is an idea that arguably cannot be constrained into a single discipline (Zedner, 2009: 10; Ngoc Cao and Wyatt, 2016: 415), the joining of environment and security (once common only in international relations' geopolitical focus on environmental impacts upon states, see Chalecki, 2013: 4; Brauch, 2008: 31), has come to included broader understandings, such as legal scholar Hulme's (2009: 25) explanation of the term as capturing 'the environment's ability to impact on human security and man's ability to impact on the stability and viability of the biosphere. Similar definitions can be found in green criminology (e.g. see Shearing's (2015: 261) description of environmental security as an umbrella term for 'water security', 'energy security', 'food security', 'climate security') and in international relations (e.g. see Dalby's (2002: 60) description of 'developing an economic system that reduces dependence on a single resource, a dynamic system that can accommodate change').

The rise of environmental security concerns (see Dalby, 2002; Chalecki, 2013), prompted vociferously by climate change, has seen criminologists begin to ask what criminology could be, and should be, in this Anthropocene age (see e.g. contributions in Holley and Shearing, 2018). While answers to the question are being explored, the growth of private actors in climate governance may in fact provide rich ground for criminologists to till. As many

readers will know, private security provision has in fact been a long, rich and debated issue in criminology.

Traditionally, the governance of security in criminology (sometimes termed 'policing' – see Stenning and Shearing, 2015) referenced activities -- particularly activities by government agencies -- intended to maintain rule-based relationships with respect to property and the integrity of persons (prevention) and to respond to breaches of these relationships once they have occurred (law enforcement). For many criminologists, there was typically an acceptance, and indeed an embracing, of a Maitland-esque conceptualisation, which argued that the only way to enhance the delivery of public goods like safety, to be enjoyed by all, was to ensure the advance of state institutions (Maitland, 1885).

However, during the mid-twentieth century, evidence of a sizable private police/policing industry began to emerge (see for example, Kakalik and Wildhorn, 1977; Spitzer and Scull, 1977), albeit these claims of a pluralisation of policing were initially resisted. Today, this private sector policing (including its 'low' and 'high' variants, Brodeur, 1983; O'Reilly, 2015) tend to be termed private security in deference to the conception that 'policing' was an exclusively 'police' activity (however, for an example of the re-emergence of the term 'private policing', see Sparrow, 2014). Certainly, some consider private security as a regressive development, a 'tainted trade' (Thumala, Goold and Loader, 2011) undermining the trajectory of a long, and indeed noble, history of the governance of security becoming increasingly more inclusive, (see for example, Loader and Walker, 2007 and more recently Loader and White, 2017). While such debates continue, a burgeoning of research on private security has subsequently emerged to account for its development (for example, Jones and Newburn, 1998).

Around the same time, parallel developments between what was happening with respect to the governance of security, were also occurring in a wider field of the provision of public services (Osborne and Gaebler, 1993; Rhodes, 2007) as well environmental protection under signs of market-based instruments, light-handed regulation, voluntarism and ecomodernisation (see generally Holley, 2017). Even so, the emergence of private security as an institution for providing safety has arguably been so significant that, in many contexts and locations, it now surpasses the public police institution several times over, both with respect to the number of agents employed and the cost of security provision. Berg and Howell (2017:4-5 with internal

references omitted) provide some numbers to illustrate the situation in South Africa and Liberia:

> multinational conglomerates such as G4S reportedly operates in 24 African countries employing approximately 120,400 people. South Africa hosts the largest (known) numbers of private security companies and employees on the continent – both per capita and in terms of raw numbers. In 2015/2016, there were over 8692 security companies and approximately 488,666 registered and active private security employees in South Africa compared to 151,834 police officers in the South African Police Service (excluding civilians) and members of the armed forces. In other words, compared to the state security apparatus, private security outnumbers the public police by 3 to 1…. private security is one of the fastest growing industries. In Liberia, for instance, the private security industry reportedly doubled its revenues between 2004 and 2011, while in South Africa, private security has gone from an industry worth 600 million (USD44 million) in 1986 to current estimates of it being worth 60 billion Rand (USD4 billion).

With the growth of such a large industry, regulation of private security has understandably come to focus on attempting to ensure that the industry operates within legal parameters and that minimum standards are maintained, both as a protection to customers and to ensure that the activities of the industry, when engaging persons who are threatening to harm or have harmed the peace of their employers, is done within legal boundaries (see e.g. Berg, 2003; Button, 2007; Abrahamsen and Williams, 2011).

As the 'web' of regulated security assemblages has grown (Brodeur, 2010; Abrahamson and Williams, 2011), traditional police have become one node among many within a nodal security delivery landscape (Johnston and Shearing, 2003). Within this framing, the central issues of securing security have become who does what, in what context, under whose auspices and how various nodes relate to each other as they engage in the provision of safety. In Brodeur's (2006:ix) words, this pluralisation of security 'does away with the single stuff mythology'. This has given rise to new research agendas that have embraced the study of both public and private auspices and providers of security governance (Berg, Nakueira and Shearing, 2014), an area which has relevance to the emerging private provision of environmental security for our planet.

Environmental Security, Finance and Insurance

As with many polycentric governance systems, the range of finance and insurance practices that are emerging evidence diverse definitions of 'climate', 'green' and 'sustainable' finance, an array of public and private funding sources, a multitude of objectives and a multiplicity of implementation channels (public, private and civil society implementors), often with varying priorities (energy, forests, urban infrastructure) (Lundsgaarde, Dupuy and Persson, 2018: 3). Phelan et al. (2020, 2011), for instance, highlight various pathways of action in insurance, ranging from largely adaptive approaches aimed at increasing insurers' capacity to accommodate the climate risks faced by their policyholders; 'weakly mitigative', meaning that they provide for some mitigation, but on a very limited scale; and few pursing 'divest and decline' actions by insurance industry described as 'strongly mitigative'.

Such diversity of responses from finance and insurance companies in this challenging context is not necessarily 'bad' (Lundsgaarde, Dupuy and Persson, 2018), but they do represent an emerging challenge for thinking about and responding to the governance of our shared environmental security, how it might and should be organised and who can and should be delivering public goods as the field of climate governors continues to broaden and decentre. The still-nascent generation of practices and thoughts on these issues points us in useful, and sometimes contradictory, directions, with which theoretical and empirical scholarship is slowly grappling (Wood et al., 2019). Ideas and theories both outside (Wood et al., 2019; Braithwaite and Drahos, 2000; De Búrca, Keohane and Sabel, 2014 and inside criminological scholarship (Ericson and Carriere, 1994; O'Malley, 2018; Nel, Shearing and Reyers, 2011; Herbstein et al., 2013; South, 2015: 273; Hall and Farrall, 2013: 126–127) have begun to explain, understand and reform the role of private actors in governance global finance and insurance industry, and this edited book seeks to add to the endeavour.

The chapters in this book explore:

- sites of optimism and innovation in the role of the private finance industry as environmental security actors;
- how to enhance the activities of these private governors; and
- the implications of these trends for the private provision of security.

Each of the chapters adopts a somewhat different take in exploring these questions, and here we provide a brief overview of each chapter, with an eye to their collective reactions to these three issues.

Otto-Mentz and Strumpfer, in 'Co-creating sustainable risk futures: a role for insurers', begin by acknowledging the role insurance plays as society's safety net. Insurers manage risk by transferring and pooling risk and communicate risk levels to consumers through insurance pricing and contract conditions. However, in practice insurance coverage is often not comprehensive, leading to gaps in protection, particularly in the face of disasters. In response, 'protection gap entities' have evolved: consortiums of public and private entities established to build resilience against disaster risk. Initiatives of this kind underscore the importance of cooperation in risk management. Otto-Mentz and Strumpfer argue that climate change now presents a challenge that exceeds the insurance industry's capacity to manage financial risk and build resilience, and cooperation is now not only desirable, but essential. Otto-Mentz and Strumpfer call for collaboration amongst diverse organisations in order to manage problems that are 'too big' to be managed by a single entity. With this in mind, they cast their gaze beyond the financial sector to an illustrative historical case study of co-creation through the Durban Functional Region Forum in South Africa. Drawing on the lessons from that case study, Otto-Mentz and Strumpfer argue that insurers could – and should – play a key role in facilitating collective efforts at risk management through opening their strategy processes, but that the key to success for initiatives' in this vein will be their broader societal engagement.

Gunningham, in 'Crime, regulation and climate finance', explains – bluntly – that 'humanity is on a trajectory to destroy the habitability of our planet and to precipitate the largest mass extinction of species in the last 65 million years'. He does so in order to bring focus to the needed development of rules to foster and govern climate finance flows. On any assessment, effectively mitigating climate change calls for tremendous amounts of finance – at least scores of trillions of dollars for low-carbon infrastructure, renewable energy, energy efficiency, and other mitigation measures in the near future. Finance at this scale is available in the private sector, but the sector itself is new in its attention to sustainability, and lacks a tried and tested architecture for operating in this new arena. With reference to the 2008 Global Financial Crisis, Gunningham points out that underregulated financial markets can cause catastrophic social and economic harm, and argues the case for new and effective

financial market regulation. However, even as there are varied approaches available to effective regulation there are challenges, and Gunningham reviews key approaches. Effective mitigation of climate change will call for action extending beyond the financial sector – other economic instruments such as a price on carbon will have roles to play as well. Gunningham leaves readers with a broader question: can a rapid transition to a low carbon economy be achieved 'within the strictures of capitalism'.

Sinclair, in 'Speak loudly and carry a small stick: Prudential regulation and the climate, energy and finance nexus', argues that government action will be insufficient for preventing dangerous climate change, and that the financial sector has a role to play in achieving a transition to a low-carbon economy. While civil society has long sought to change societal norms about the desirability or otherwise of investment in fossil fuels, it is only more recently that finance sector regulators in Western countries have begun to craft policy responses to climate change framed as a risk to financial order and stability. These regulatory responses by states are, in Sinclair's view, still 'nascent', and Sinclair assesses their impacts and limitations, as well as their possible futures. New regulatory responses focused on financial stability offer some prospects for leveraging the financial sector as environmental security actors, but Sinclair notes that these approaches remain 'very tentative indeed', where a much more muscular approach is called for.

Charbonneau and Doyle, in 'The contradictory roles of the insurance industry in the era of climate change', bring focus to the dual role the insurance industry plays in both creating and managing climate risk – the insurance industry is, after all, central in fossil fuel-driven economic growth, and generates revenue from two primary sources tightly wound through the economy: underwriting and investments. The authors note insurers' market-based initiatives that increase their capacity to assume risk serve as adaptation measures as climate risks increase. One is reinsurance – insurance for insurers – which enables insurers to transfer risk to a larger pool within the industry. Another is to sell insurance-linked securities, in order to transfer risk beyond the industry entirely, and onto larger equity markets. Charbonneau and Doyle also note the existence of insurance schemes for climate-implicated weather risks that draw on private and state actors. These measures are effective adaptations to climate change, but do not contribute to climate change mitigation. Ultimately, even as some insurers are taking steps in the right direction, Charbonneau and Doyle question the potential of – private

– insurance actors to drive effective change, and instead look to nation states to drive transition, through public policy and international collaboration.

Mallon and Phelan, in 'Quantifying changing climate risks and built environments in Australia: Implications for lenders, insurers and regulators', bring attention to the quantification of climate risks. Their chapter analyses the recent report *Climate Change Risk to Australia's Built Environment: A Second Pass National Assessment*, published by Cross Dependency Initiative, a risk analysis company that provides infrastructure risk analysis and quantification for governments and utilities in Australia and internationally. That climate change exacerbates some weather risks is not controversial and is a well-understood output of global-scale climate models. However, quantifying climate-exacerbated weather risks at local scale is more challenging. Coastal inundation, forest fires, riverine flooding and other risks all present significant and growing risks to built environments in Australia. In this chapter Mallon and Phelan offer a brief 'tour' of the quantification method and challenges, by way of framing the challenge changing climate risk profiles present to key stakeholders in property: insurers, lenders, and the regulators of insurers and regulators. Mallon and Phelan argue that increased transparency about long-term risks to property is essential to support informed decision-making about effective climate change adaptation investment.

Du Toit, in 'The influence of government regulation on insurers' responses to climate change', begins by noting that some larger, mostly European insurers have in recent years begun to exclude coal (and to a much more limited extent, some other fossil fuels) from their extensive investment portfolios. A smaller subset has taken a further step, and begun to exclude coal from the underwriting side of their business too. Even as the number of insurers involved is small, this is a significant development: insurers have long been subject to calls from civil society to respond strongly to climate change, i.e., with the intent to mitigate climate change, rather than the more limited ambition of adapting to it. The reasons for insurers' decisions are surely complex. Nevertheless, in this chapter du Toit seeks to explore the particular role of governments' and regulators' in influencing insurers' decisions to divest from coal. Du Toit notes that insurers with coal exclusion policies tend to be domiciled in states that have stronger rather than weaker regulatory responses to climate change, including France, Norway, the Netherlands and the United Kingdom. There are other drivers for insurers' coal exclusion policies, including stranded asset risk and reputation risk, and du Toit reviews these also. Du Toit concludes that while no single driver is determinative,

government regulation is significant, and suggests further opportunities for government regulation to strengthen insurers responses even further. This is likely essential, given du Toit noting that corporations generally – including insurers – are 'ill-suited' to addressing climate change.

Simpson, in 'Insurance in the Anthropocene: Exposure, solvency and manoeuvrability', provides an important case study of strategic decision-making within an African insurer seeking to navigate three key challenges facing the industry and its regulators: climate risk exposure, solvency, and manoeuvrability. The insurer has operations across 35 countries – 32 in Africa and three in Asia – and its short-term division is engaging currently in understanding, responding to, and anticipating material risks of climate change. Drawing on a research process comprising workshops and interviews, Simpson's empirical observations bring attention to the practical challenges of managing risk even as climate change renders actuarial models based on historical record decreasingly useful. One example is overlaying historical loss data with GIS-based modelling, in order to more precisely identify risk at property scale. In this way, the insurer can better price risk prospectively, rather than relying only on claims histories. Beyond climate risk exposure, Simpson also notes examples of innovation in practice with regard to solvency and manoeuvrability. Across all three areas, changes in technical practices in turn lead to changes in internal business processes.

Bowman and Wiseman, in 'Finance actors and climate-related disclosure regulation: Logic, limits and emerging accountability', note that climate-related corporate disclosure has become a favoured regulatory tool, aimed at leveraging financial market logics to help mitigate risks associated with climate change. Following the influential industry-led Taskforce on Climate-related Financial Disclosures (TCFD), increased expectations about climate risk reporting are proliferating in legislation and regulatory guidance. Despite these developments, widespread concern remains about the limits of the disclosure paradigm and the quantity and quality of information being disclosed. Questions of accountability and enforcement are now receiving increased attention, especially in relation to systemically important financial firms, such as banks and insurers. Bowman and Wiseman explore the logic of climate-related disclosure, emerging forms of accountability, and likely future regulatory trends in this area. They do so by using a case study of complaints to the UK Financial Conduct Authority (FCA) against three listed insurance companies by civil society organisation, ClientEarth. They further discuss challenges associated with the contested legal

concept of ‘materiality’, which underpins many financial market disclosure frameworks, and identify the need for robust assurance, accountability and complementary regulatory design for the logic of climate-related disclosure to fulfil its aspirations.

New, Dorbor, Odoulami and Maslo, in ‘Towards attribution-based climate insurance: redefining who should pay for weather-related insurance’, explore how defining attribution for climate change-related losses could be used as a basis for calculating equitable contributions to weather insurance premiums in Africa. There are several parts to the argument. Firstly, New et al. note that agricultural (and other) losses are rising, and that this is due to climate change, through climate-implicated extreme weather events such as droughts. This, in turn, leads to increased premiums for insurance covering those extreme weather events, and African countries have limited capacity to pay for increased insurance premiums. Secondly, common but shared responsibility for climate change mitigation and adaptation is already established in key international climate agreements. Thirdly, it is now technically feasible to distinguish between the quantum of ‘background’ risk, i.e. the risk that would be present absent climate change, and the additional risk attributable to a changed climate, in order to quantify what proportion of the risk is ‘natural’, and what proportion is anthropogenic. New et al. propose that the cost of insurance premiums could be split accordingly, between African states as policy holders on the one hand, and on the other, international climate funds to which industrialised countries contribute. Agricultural insurance for drought risk in Malawi serves as an illustrative example of how such an approach could be operationalised.

Collectively, these chapters comprise a highly diverse and thoroughly thought-provoking range of perspectives and insights, and much promise. With an eye to the potential for the private finance industry to function as a fulcrum institution – an institution whose actions can leverage the engagement of others – contributors identify multiple sites of optimism and innovation. One example is a significant African insurer in the process of amending their approaches to risk calculation in order to price climate risks more accurately, towards ensuring its financial viability in the face of changing climate harmscapes (Simpson). Insurers beginning to exclude coal from the investment portfolios (du Toit) is another example. Other contributors look to the need for new financial instruments and architecture (Gunningham) to facilitate effective action, and propose models for the fair funding and effective operation of new insurance instruments (New et al). Others again note that

continuing extension of climate modelling's potential, especially when combined with other data gathering and analysis methods such as Geographic Information Systems, is opening up new possibilities for transparency around changing climate harmscapes at local scales (Otto-Mentz and Strumpfer, Mallon and Phelan); better data can inform better decisions-making by governments, regulators, insurers, lenders, and citizens. Also recognising the importance of climate information transparency, climate-related disclosure is becoming a favoured regulatory framework, increasingly expected by both favoured regulatory framework (Bowman and Wiseman) and regulators (Sinclair).

And yet, even as the private finance industry suggests possibilities, for many contributors, it is in fact the liminal zone between public regulators, and private actors as new environmental security actors regulating climate harmscapes, that suggests most promise. A recurring theme in the contributions to this volume is the call for greater robustness by public regulators in their engagement with private actors (see Sinclair). This observation is made at sectoral scale (see Gunningham, and Mallon and Phelan), and is also a call made by private actors themselves in some instances (see du Toit). Others focus on ways to make best use of newly emerging expectations (Bowman and Wiseman). Others look specifically to private-public linkages in order to amplify possibilities for finance, and insurance in particular, to play a constructive role in equitable climate adaptation (New et al.). Others still extend beyond a public-private framing, to call for collaborative approaches, as both desirable and necessary (Otto-Mentz and Strumpfer). However, other contributors adopt alternative perspectives, such as a call for regulators to craft regulatory frameworks that create more operating space for businesses seeking to respond to climate change (Simpson). In contrast, others (Charbonneau and Doyle) look beyond private actors towards states, to drive policy collaboration at international scale.

As is perhaps now apparent, even while recognising that private actors have contributions to make towards regulating climate harmscapes, the role of public regulators has by no means diminished, much less disappeared. Rather, regulation of climate harmscapes has become more complex: there are multiple diverse actors in play, operating at multiple temporal and spatial scales, and with influence spreading beyond finance to many other sectors. Energy – old and renewable – is one key sector influenced by the finance sector: witness insurers beginning to step away from coal. Property is another: both insurers and lenders are key stakeholders in built environments, and property values are strongly dependent on continuing

access to affordable insurance and loans. The role of public regulators is therefore as important as ever in governing climate harmscapes.

As a species, we continue to accelerate our fossil fuel emissions into the Earth system. As such, the prospect of mitigating climate change is receding more and more quickly, rather than drawing closer. Indeed, we are living in the Anthropcene, and driving change at planetary scale. Albrecht (2019) has responded by arguing for the need to bring the Anthropocene rapidly to a close. In his view, we should be urgently seeking to establish a new age: the Symbiocene would be characterised by humans living in symbiosis with the Earth and all its inhabitants. One strength of the term 'Anthropocene' is that it brings attention to humans as a driver of planetary change: and the importance of this realisation for our species cannot be underestimated. But it comes with limits: beyond the acknowledgement that humans are driving change at planetary scale, there is no sense of consciousness or purposeful direction in the term. In order to stay within Raworth's (2009) ideas of 'donut economics' and the provision of 'a safe and just operating space' on this planet, we will need to move to purposeful pursuit of sustainable alternatives. This is not a challenge solely for insurers, nor the wider finance industry, but meeting this challenge will surely require their important contributions.

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