WORKING THROUGH PLANETARY BREAKDOWN

Labour, Skill and the Changing Climate

Edited by Chantel Carr and Jesse Adams Stein

First published 2026

ISBN: 978-1-032-84325-4 (hbk)
ISBN: 978-1-032-81771-2 (pbk)
ISBN: 978-1-003-51224-0 (ebk)

Skill, industrial transformation and work in a climate-changing world

Chantel Carr and Jesse Adams Stein

DOI: 10.4324/9781003512240-1

The funder of the Open Access version of this chapter is Jesse Adams Stein's Australian Research Council Discovery Early Career Research Award (DE210100158).

Routledge
Taylor & Francis Group
LONDON AND NEW YORK

SKILL, INDUSTRIAL TRANSFORMATION AND WORK IN A CLIMATE-CHANGING WORLD

Chantel Carr and Jesse Adams Stein

Introduction

In early 2025, images of catastrophic unseasonal wildfires bearing down on Los Angeles, California, shocked the world. The intensity was clearly evident as the fire moved rapidly through the city's hills and reached deep into its iconic beachside suburbs. On the other side of the Pacific Ocean and in a different hemisphere, east coast Australians were watching closely. Many knew exactly what the city's residents were facing: the scenes were reminiscent of the 2019–2020 Black Summer bushfires that devastated south-eastern Australia, destroying 3000 homes and killing 33 people.[1] There was also deep concern among Australia's firefighting experts for what these Californian winter fires meant for local firefighting capacity. Australia leases up to six large water-bombing tankers from North America during the southern hemisphere summer. Former Fire and Rescue NSW Commissioner Greg Mullins outlined the demands an extended North American fire season would place on the highly skilled specialists whose services are now in demand across two continents *at the same time*:

> Fire season used to be quite distinct. The North American fire season would finish and ours would start. We'd be able to share things like large aircraft and if we had big fires, we could call them and get specialist firefighters, incident management personnel.[2]

Mullins' insight starkly illustrates how the changing climate is already disrupting established patterns of work, in this case resource sharing for emergency response between two nations. The example highlights critical questions about the capacity of existing systems to cope with the escalating challenges of a warming world.

DOI: 10.4324/9781003512240-1

It is evident by now that climate change is already impacting working lives, and that it will dramatically re-shape the future of work across all sectors.[3] At the heart of mitigation efforts is the imperative to decarbonise energy generation, industrial production systems, the built environment, transport, food and agriculture, and waste systems.[4] Enormous amounts of human labour and skill are urgently required to plan and implement these transitions. Such large-scale decarbonisation efforts are necessary for lowering greenhouse gas (GHG) emissions to a level that will – in a best-case scenario – limit the catastrophic climate impacts of a global surface temperature that has already broken through a 1.5°C threshold. However, industry transitions and decarbonisation are not the only contexts where work and skills emerge in climate change response, and arguably they are not always the most important. As the example above shows, severe weather patterns, rising sea levels and unprecedented weather disasters across the world are generating additional forms of paid and unpaid work. This is the work of climate adaptation: responding to extreme conditions, moving populations away from places in harm's way, rebuilding infrastructures (both social and physical), and supporting communities recovering from disasters.[5] Much of this work is highly practical and localised in nature: it is directly responsive to a given moment, it is often manual or physical, it can be dangerous, it is often social, organisational, highly complex, and based on care for people, ecologies, infrastructures and environments.

While climate science has given us a reasonably clear picture of the environmental realities we are likely to face, less is understood about the skills and capacities that will be needed even in the very near future, or how existing labour structures and work tasks will be transformed. Across the spectrum of climate change mitigation and adaptation, research is urgently needed to understand how the very nature of work itself is changing, and how we might work through the challenges ahead.[6] Inevitably, climate change will demand new ways of theorising and understanding work.[7] Accordingly, the way scholars, policymakers and labour institutions respond to questions about human labour must also shift and expand. How might the work of climate mitigation and adaptation be resourced and organised? What impact will technological change have on both established and emergent labour processes? How might we need to rethink skills and training to address decarbonisation and disasters simultaneously? Who will benefit from the wholesale re-organisation of work that is already underway, and who might get left behind? How can we ensure that work in a warming world does not reproduce the injustices – colonialism, rampant resource extraction, and exploitation of vulnerable social groups – that have characterised capitalist economic development to date? What role can workers play in shaping climate change mitigation and adaptation? And is it even fair to ask that of workers – given the chief culpability for determinedly increasing GHG emissions in recent decades lies with a relatively small number of multinational corporations?

Such questions – endless in themselves – feel very 'of the moment', but there is evidently an extensive legacy of research on work, labour and skill that has examined similar themes in earlier moments of industrial transformation and upheaval.[8] While the authors in this collection write with their gaze on current and future challenges, we remain deeply informed by labour theories, debates and research from past decades, across the social sciences, law, history and industrial relations. Emerging out of nineteenth and twentieth century industrialisation, questions of worker agency, power relations and collective action have energised progressive labour researchers and activists for decades. Much of this work has been pioneered by feminist scholars, whose research has radically expanded perspectives on what counts as work, and contributed new insights into how different kinds of work are valued through intersecting lenses of gender, class and race.[9] Such approaches have long drawn attention to how capitalist economies rest precariously on a bedrock of unpaid, undervalued and largely invisible work, much of it centred on care.

Climate change is evidently scaling up the need for care. Patrick Reid, Chief Executive Officer of Australian aged care provider IRT Group vividly described the multiple challenges their workers faced in keeping residents on the New South Wales (NSW) south coast safe during the Black Summer bushfires:

> Transferring frail aged care centre residents was a significant challenge – a number of residents required ambulance transfers at a time when the ambulance service was under significant pressure. [The] employees have been simply amazing. Despite the loss of mains power, road closures and communication blackouts, they have focussed on caring for our residents and keeping them calm, sometimes while their own homes and families were under threat.[10]

Reid's account illustrates not only how care is crucial in disaster response, but also the complex intersections of paid and unpaid labour, and how geographical context and localised knowledges are central to the work of climate adaptation. In reflecting on such accounts, long legacies of labour research remind us that it is critically important that we remain attentive to worker agency and intersectional power dynamics. As we seek to understand how working lives are re-shaped by new waves of change, we must build carefully on existing research foundations, remaining ever-mindful that work extends beyond paid employment, varies across diverse geographies, and that it is *always* politicised.

The *All Hands on Deck* project[11] – our 2023 symposium and two edited collections – has sought to bring a sense of historical and geographical sensitivity to bear on the pressing work of climate change, and the skills that will be required to address it.[12] This collection – *Working through Planetary Breakdown* – is purposely diverse in approach. While some authors are established labour and industrial relations scholars, others have approached questions of work

and skill through their research on climate and energy policy, design, law, and political economy. Some contributors – such as Mark Dean and Daniel Nicholson (Chapter 10), Elizabeth Humphrys (Chapter 9) and Tom Barnes (Chapter 11) – are explicit that climate change is not the only challenge confronting the domain of work, exploring intersections with other current global 'breakdowns', such as the fallout from the Covid-19 pandemic and the opportunities and challenges of recent technological transformations ('industry 4.0').

This introduction sets out a research agenda that is centred on a grounded approach to questions of work, skill and climate change. It makes the case that important insights on the creative and adaptive capacities of workers emerge when starting from the perspective of lived experience. These capacities will be crucial for meeting the challenges ahead, but they are almost impossible to locate and support without detailed qualitative research. While labour and economic statistics are instructive and can tell us a great deal about broader geographical or sectoral shifts, scaling down to the 'fine-grain' is critical for understanding how people anticipate and manage all kinds of change, both in their working lives and of course, outside of it. Accordingly, we have placed an emphasis in this volume on empirical accounts of work and the perspectives of workers, with eight of the eleven chapters engaging with themes of skill adaptation, occupational shifts, and lived experience amidst environmental and technological change. The remaining three chapters are broader in scope, but no less important: they offer practical critique and concrete pathways on some of the most pressing concerns at the intersection of work and climate today: just transitions and the imperative to cease fossil fuel extraction, under-utilised routes for revitalising industrial democracy and worker voice, and the need to integrate industrial policy with workforce development at the regional scale.

In what remains of this introduction, we situate our grounded approach in relation to existing and emerging research on climate change, work and labour. We emphasise the importance of deeply engaging with people and skills both within and beyond existing labour markets, and connecting these insights with the starkly uneven ways climate change and the dynamics of transition are unfolding across geographies. Our launch point is the now well-established just transitions discourse, which is central to the uneven landscape of climate mitigation response – from the necessary transformation of carbon-intensive sectors to the scaling up of clean energy industries.[13] We then turn our focus to the even more urgent work of climate change adaptation, which has received far less attention in Global North settings.[14] Emergent in this context are questions of what and whose knowledge is brought to bear to manage the uneven – and already present – risks and vulnerabilities in the context of climate change. Our interests here are in how we might identify and re-value marginalised, vernacular and place-based knowledges and skills in addressing climate adaptation, and how the agency and resourcefulness of workers *already on the front line* might be better integrated into adaptation governance. We then reflect on what

it means to do research on work and climate change from Australia, a wealthy country with a heavily resource-based economy, where the effects of climate change are also already evident in catastrophic fires and floods in recent years. Finally, we outline the structure of this collection, and provide an overview of the chapters within.

The work of climate mitigation: Just transitions, decarbonisation and industrial transformation

How do we ensure that no one is left behind through the structural transformation that will accompany decarbonisation? This question is at the heart of *just transitions*, a contemporary labour project encompassing key aspects of the debate around work and climate change mitigation. With its roots in North American unions active in the chemicals sector in the early 1990s, the concept of a just transition emerged out of the comparative neglect of workers and communities affected by the regulated closure of environmentally damaging industries.[15] In contrast with attention directed towards the rehabilitation of toxic land, Tony Mazzochi of the US Oil, Chemical and Atomic Workers Union (OCAW) argued that workers and their families were neither recognised nor compensated as production ceased. In the 30 years since OCAW began advocating for a just transition for chemical industry workers, the concept has found application across many sectors. At its core, institutional proponents of a just transition (i.e. organised labour) recognise that as governments and private capital shift away from carbon-intensive industries, workers who are not as mobile – occupationally or geographically – deserve a voice, genuine agency, and in some cases material assistance to transition to new kinds of work.

With substantial union, academic and activist advocacy across different sectors, the political purchase of just transitions has greatly accelerated over the last 10 years, to the point where the concept is now used broadly, often as shorthand for seeking ethical working conditions and more democratic worker representation across many sectors.[16] The International Labour Organisation's *Guidelines for a Just Transition towards Environmentally Sustainable Economies and Societies for All* was produced in 2015.[17] These guidelines recognise that workers, governments and employers are all key stakeholders in developing transition plans that consider the environmental impacts of some sectors, while also addressing the need for decent work and social inclusion. The concept of a just transition also gained further reach in 2015, when it was included in the preamble of the Paris Agreement: "Taking into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities." The embrace of just transitions by global institutions has had mixed consequences, not least that the concept has become increasingly slippery, and is sometimes deployed in disingenuous ways so that extractive business-as-usual can

continue.[18] In this collection, Chapter 6 sees interdisciplinary labour law scholar Frances Flanagan contribute to these discussions with a proposal for a simple and direct intervention that would give the concept some "teeth". As Flanagan argues, a key weakness of just transitions frameworks are that they often lack a clear remit to cease fossil fuel production. She proposes adding a "just cessation" clause to institutional transition frameworks, explicitly calling for an end to fossil fuel extraction *with specified time frames*. This would, Flanagan argues, enable employers, the state, and labour institutions to more directly address the implications of fossil fuel phaseout for workers, taking at least some of the edge off their conflicting interests in the process, while prioritising material outcomes for both the environment and workers themselves.

Meanwhile, others continue to question the often-limited application of just transitions on supporting workers in carbon-intensive industries, arguing that everyone is going to be affected by climate change and the industrial transformation that is already underway. We remain mindful that many workers are often rendered invisible by an over-emphasis on energy systems or industrial production. Workers in smallholder agriculture and food production, for example, including many in Global South/majority world settings, are disproportionately impacted by the effects of the changing climate.[19] Feminist and critical researchers and activists also caution against an over-emphasis on industrial workers, noting the risks of reinforcing existing hegemonies – many marginalised groups are unlikely to have access to the vast numbers of green jobs anticipated by powerful organised labour institutions.[20] Much of our own research has centred on industrial workers, although we note that this is conducted with a gender-reflexive lens that seeks, for example, to understand the operations of hegemonic masculinity in workplaces, and the motivations behind particular political persuasions.[21] Accordingly, we share many of these sentiments regarding invisible labour, and can certainly testify to the gendered, classed and racialised nature of industrial work in many Global North contexts.

Beyond sectoral perspectives we foresee a critical *place-based* dynamic to transition and industrial decarbonisation that is receiving growing attention, but has not yet landed in the intimate spaces of everyday life beyond broadly generalised 'affected workers and communities'.[22] It is worth explicitly remembering that workers do not exist in a vacuum independent of other social relations. As Carr and Larkin discuss in Chapter 7, industrial workers are embedded in households, families and communities where other household members are frequently employed in service sectors.[23] *Their* lives too, are already being reshaped as key industrial sectors decarbonise. In short, while we see continued traction in the idea of just transitions, we join many colleagues in advocating for more care and specificity in how these ideas are deployed in practice across different contexts.

We are however encouraged by nuanced perspectives on just transitions emerging from the field, which are already testing the limits of conceptual and

discursive approaches.[24] While global and national frameworks are important analytical entry points, 'the ground' is where explanation, expressions of solidarity and most importantly, workers and communities, reside. Here we look to advocate for more empirically grounded research that looks deeply – and *qualitatively* – at the skills and capacities people already have, as well as those needed, to address climate mitigation and adaptation. Such research is vital for moving beyond narrow technical framings of skills as mere labour market commodities that can be exchanged or transferred between sectors.[25] Rather, skills are complex, situated, sometimes invisible and often undervalued – they fundamentally give people agency, not only as paid workers within labour markets, but also beyond them.[26] It is precisely in looking beyond the technical competencies often invoked in institutional just transitions frameworks that adaptive capacities and crucial place-based knowledges emerge. The first section of this volume, *Skills and Training*, looks at these themes in detail, addressing the diverse ways people acquire skills, the role of informal learning and embodied knowledge, and how skills are transferred and deployed across domains outside of paid work, including household adaptation, community-based skill sharing, and forms of practical knowledge that often go unrecognised in formal transition planning. Such skills and informal networks, while rarely captured in policy discussions, are already proving crucial for community resilience and adaptation.

Across the wealthy economies of the Global North, the last two decades of climate policymaking has emphasised sectoral decarbonisation and the challenge of climate change mitigation, yet this attention has not translated into sufficient action.[27] It is now clear that adapting to a changed climate is both necessary and urgent, and that communities worldwide are already experiencing vastly uneven capacities to respond and cope with these changes.[28] Inadequate planning is starkly evident across both mitigation and adaptation domains: in the hasty withdrawal of global capital that leaves local workers, communities and governments scrambling to respond; and in the volunteer labour required to plug the gaps in the aftermath of disaster events. This largely reactive approach has significant risk implications for workers and communities. In an analysis of adaptation-related job advertisements in Australia, Todd Denham and colleagues point to both urban and professional services biases in how planning is currently conceived.[29] Their findings highlight uneven capacities for adaptation planning, particularly in non-metropolitan regions that are often also host to carbon-intensive industries on the front-line of mitigation efforts. The situation is one of a 'perfect storm' for such regions, compounding skills gaps and deepening vulnerabilities. An integrated, place-based approach to just transitions *that includes adaptation* would help address the gaps inherent in sectoral-based planning,[30] ensuring that workers and communities are not left to navigate the complex challenges of climate change with inadequate support, further deepening existing inequities.

From sectors to places: Flexible capacities, care and the work of climate adaptation

Many of the chapters in this volume emphasise workers' capacities for flexibility, in turn (and often inadvertently) highlighting the limits of existing institutional skills frameworks for addressing the challenges of climate change. In their fetishisation of job numbers and the formalisation of 'green' skills, governments at all levels frequently overlook how people move through careers and between sectors, stringing diverse skills together in ways that are difficult to capture in quantitative terms. In Chapter 5, Jesse Adams Stein provides a counterpoint to high-level and often abstract perspectives that fail to capture the portability of skills across domains. Stein's approach – examining workers' lived experiences and career trajectories – reveals capacities for transferring skills across domains that jobs metrics typically miss. The formal labour market consistently undervalues these flexible capacities often because they are simply invisible, and despite their effectiveness in 'getting the job done', for example in localised responses to disaster situations.

This disconnect between institutional conceptions of 'climate work' and the flexible capacities actually needed and deployed during disaster and disruption has significant implications for both policy and practice. When adaptation planning narrowly focuses on technical risk assessments performed by credentialed professionals (who often 'drop into' regional locations from major metropolitan centres),[31] it reproduces what Pearse and Bryant identify as "hierarchies of value"[32] that discount the essential on-the-ground labour of repair, care, and community-building. These hierarchies privilege certain forms of expertise while rendering invisible the practical skills that communities depend on during crises. As communities navigate both incremental adaptation and acute disaster response, they will come to rely heavily on people who can integrate new responsibilities into their existing roles, cross professional boundaries, and apply their experience to new and unprecedented situations. In short, the work of climate adaptation is already taking place on the ground, though it is largely overlooked in national adaptation policy and planning.

Questions of how to locate and support care are also central to understanding the work of climate adaptation, and are reflected in this volume. The systematic undervaluation of care across many societal contexts is evidently being reproduced in relation to climate change. In Chapter 9, Elizabeth Humphrys examines how extreme heat compounds existing workplace vulnerabilities in the home-based care sector. Humphrys' findings demonstrate how the burden of managing climate risks falls disproportionately on already-marginalised workers, often in low-paid roles. This care work is all but invisible, yet it will play an increasingly critical role in community resilience. Despite this systematic neglect, existing institutional frameworks offer some hope in the form of under-utilised pathways to better protect and value care in climate adaptation.

Stronger powers for Workplace Health and Safety (WHS) committees for example, as Eugene Schofield-Georgeson and colleagues identify in Chapter 8, could provide a route through which such concerns might find traction within existing legal structures. However, as the authors collectively caution, a disconnect between these protection mechanisms and the outcomes they currently deliver reveal how power imbalances shape adaptation in practice.

Critical gaps in how the work of adaptation and mitigation are conceptualised and valued underscore the essential role of grounded qualitative research that centres the experiences of workers themselves. Context matters profoundly in climate response: regional geographies shape sectoral transitions to address mitigation, while adaptation strategies must be distinctly place-based to be effective. Workers' lived experiences also reveal how communities self-organise across different scales, from workplace committees to neighbourhood networks to larger regional and national alliances, creating flexible capacities that formal planning often overlooks. In what follows, we examine why Australia is a particularly illuminating context from which to understand these dynamics.

Writing from Australia

Aside from the first chapter by Barker and Cox on UK prepper cultures, the chapters in this collection largely emerge from an Australian context. As editors we have grappled with this geographical emphasis,[33] in time coming to view it as a strength, rather than a limitation. Australia has spent a good part of the twenty-first century in the climate 'doldrums', and is now scrambling to catch up industrially, following what was a decade of climate inaction. From 2013 to 2022, as efforts to address climate change began to dominate the geopolitical agenda globally, the conservative Liberal-National Coalition held power in Australia. This was a government that actively obfuscated action on climate change. Party rhetoric around the importance of fossil fuels to jobs, and to the Australian economy, dominated political and media discussion. The third conservative Prime Minister of this term, Scott Morrison, famously brandished a lump of coal in the Australian parliament in 2017, smirking as he said to fellow parliamentarians: "This is coal. Don't be afraid, don't be scared."

After a decade in the global 'climate wilderness', Australia experienced a (slight) shift towards a more progressive climate politics in 2022, with the election of the Australian Labor Party. In recent years the nation has seen some concerted action in addressing energy transitions and the work of climate mitigation and adaptation. At the time of writing, the Labor government has just been re-elected. Their first-term track record included the *Climate Change Act 2022* (Cth) with specified emissions reductions targets, and the *Future Made in Australia Act 2024* (Cth) aimed at identifying and supporting priority sectors for investment with an emphasis on emergent 'green' industries. During this term a Net Zero Economy Authority was established,

mandated through the *Net Zero Economy Authority Act 2024* (Cth), with a coordinating remit to manage transitions from coal-fired energy generation. The *Offshore Electricity Infrastructure Act 2021* (Cth) was also passed, setting out the parameters for a whole new sector to deliver gigawatt-scale renewable energy in Australian waters. But the progress has been offset by some significant missteps: the planned repeal of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and its replacement with stronger environmental protection measures was thwarted in 2024,[34] and there remains persistent bipartisan disinterest in addressing Australia's Scope 3 emissions (largely coal and gas exports used in other nations). The challenges of addressing climate and energy while bringing the electorate along remain immense, and seemingly beyond the capacity of the two major parties in Australia. Needless to say, the space is highly contested and the political will for meaningful but difficult structural transition is patchy at best, even amongst the supposedly 'progressive' Labor party who continue to approve new coal and gas developments. Almost immediately following their re-election, Labor signed off on the North-West Shelf project, extending Woodside's licence for gas extraction until 2070. Action on climate change is made infinitely more difficult by a Liberal-National Coalition opposition intent on wedging the current Government on climate and energy. Whether the last three years of moderate progress will continue remains to be seen, and global geopolitical factors – not least the uncertainty precipitated by the re-election of Donald Trump in the US in 2025 – will also have a significant bearing on Australian climate politics over the next decade.

The authors in this collection are tracking these national and global developments closely, and with many sectors facing significant challenges around decarbonisation, there is a great deal more to be analysed. Yet in so many ways, things have not really shifted at all. Without addressing its Scope 3 emissions as one of the world's largest coal and gas exporters, Australia essentially remains a fossil fuel-reliant nation, with an economy still dominated by resource extraction. In this context, the nexus between work and the environment is somewhat reminiscent of earlier debates in North America and Europe, but it also simultaneously has its own unique flavour: one of sheer, urgent desperation set against a prevailing inertia. This makes Australia a useful litmus test for how significant industrial change might be achieved *quickly*, given the right policy settings, resources and political will (in a best-case scenario). On the other hand, the case of Australia might also be instructive to other geographies in terms of *what not to do*, should the strength of fossil-fuel industry lobbying continue to undermine meaningful reform or the just transitions agenda. Either way, it is clear that tensions reverberate across sectors such as energy, mining, manufacturing, construction and defence, which make up a substantial proportion of the country's economy. These tensions invariably carry over into the lives of workers.

The other reason Australia is an important context for labour-climate research is because of the intensity of climate disasters *already* being faced in this country. Some of the harshest impacts from the changing climate will be felt in the Pacific region. This includes wildfires of increasing frequency and ferocity, widespread flooding, extreme drought, unprecedented storms and rapid species extinction, alongside the global impacts of sea level rise. Two months prior to the 2025 Australian election, Cyclone Alfred bore down on the coast either side of the border between southern Queensland and NSW. Not only was it the first cyclone this stretch of coast had experienced in over 50 years, but residents were already weary and on edge – many were still working on rebuilding following devastating flooding in 2022 that resulted in almost 100,000 insurance claims totalling $1.33 billion in damage.[35] Two weeks after the election, the mid-NSW coast was hit by a 1-in-500-year flooding event, killing five people. Clearly, climate change is already a part of life and work for so-called 'ordinary' Australians, who experience almost daily discussions about heat mitigation, for instance, or contingency planning for fires, smoke inhalation or anticipated floods. The country is likewise characterised by a sense of urgency in terms of energy transitions and industrial transformation, but also a sense of foreboding in some regions and sectors of the community. Community conflict and disagreement about the nature of that change, fears for job losses, and concerns over skill-shortfalls, are also common elements in contemporary discourse.

The core themes of this volume – skill and industrial transformation – contain questions and issues that many regions and countries are grappling with. In particular, parallels between the Australian context and other capitalist Global North nations with a declining industrial manufacturing base and decarbonising energy sectors feature prominently. The collection offers insights that partially overlap with North American and European-focused studies, while demonstrating the particular challenges for transitions in a resource-extraction dependent nation. The Australian experience reveals the complexities of needing to simultaneously address adaptation and mitigation, especially in communities facing both immediate climate impacts and economic restructuring. As the International Labor Organisation makes clear, issues of skill-shortages, disaster recovery, 'just transitions' and manufacturing challenges are of course globally interconnected and networked, and many of the collection's authors situate their work within the context of political economy scholarship, lending an inherently international perspective to specific case studies. Ultimately, this volume highlights the importance of understanding local contexts while engaging with broader global discourses – bringing grounded, place-based insights to bear, creating just and sustainable futures for workers and communities on the frontlines of climate change.

Having worked through our approach to work and climate change and reflected on the context of writing from Australia, we now turn to a brief

overview of the structure of this volume. *Working Through Planetary Breakdown* is structured in two sections: the first, "Skills and Training", looks at how workers come to acquire skills through formal education, but also by informal means, across lifetimes and in unrecognised ways. The second section, "Industrial Transformation", looks at worker-centred experiences of change in the context of climate crisis. Together, these sections reveal how workers' adaptability and practical knowledge are crucial yet often overlooked resources in navigating planetary challenges.

On Part I: skills and training

In this first part of the collection, our aim is to foreground how skills are acquired, with a view to understanding the many routes through which people come to be skilled within and beyond the workplace. In keeping with the intent of broadening the scope of how we look at work, we examine learning pathways that extend beyond formal education and training. The chapters that follow reveal how practical skills are acquired and transferred over working lifetimes, often in unexpected places and through informal networks. This approach challenges conventional assumptions about skill development, highlighting the diverse ways workers adapt to – and sometimes shape – change in their fields.

In Chapter 1, geographers Kezia Barker and Rosie Cox examine how practical skills are acquired and shared within households and communities, using the example of DIY survival preparation amongst UK-based 'preppers'. Originally emerging as a response to imagined crisis scenarios, prepping centres on practices including stockpiling food and equipment and honing survival skills. The Covid-19 pandemic, climate-related disasters and geo-political instability have since propelled prepping from sub-culture to mainstream prominence. Drawing on Barker's ongoing ethnography of online prepper groups, the chapter examines discussions of 'apocalypse skills' – those needed to survive an unspecified but catastrophic situation. The chapter tracks how these discussions often go beyond specific objects, materials and skills to something deeper – a form of *adaptability* grounded in capacities to cope with change. For Barker and Cox, the crisis framing of prepping brings both pragmatic and conceptual potential: demonstrating how resources might be repurposed while highlighting value systems that operate outside of the take-make-waste model of capital accumulation. Though seemingly extreme, the case study provides a vivid framing through which to understand the value of overlooked 'soft' skills, particularly the flexibility that comes with a practical orientation, and a capacity for creativity and imagination.

Flexible capabilities are also an underlying theme in Chapter 2, where climate and energy policy researchers Kathryn Lucas-Healey and Hedda Ransan-Cooper map out the skills needed to deliver localised energy transitions

through grid-tied microgrids. Their case study is focused on the South Coast of NSW, a region ravaged by bushfires in the Black Summer of 2019–2020. Drawing on stakeholder interviews across energy, emergency management, and community sectors, the authors position their socio-technical analysis at the nexus between aspirations for localised, grid-tied microgrids, and what is needed to realise them. Their findings highlight that while local capacity building and translational skills are critical for delivering microgrids to climate-vulnerable communities, developing these capacities depends on a fundamental reorganisation of the existing centralised energy regime. Local communities have an important role to play in microgrid system design and decision-making; however existing governance frameworks fall short in creating space for energy democratisation. To address these shortcomings, the authors argue that skill development must span multiple scales – from national energy policy through to community systems and household practices.

In Chapter 3, an interdisciplinary team of engineers and social scientists, led by Elyse Stanes, critically examine the training regime that prepares 'fridgies' – skilled contractors who maintain heating, refrigeration, ventilation and air-conditioning systems – for the significant task ahead in installing, maintaining and repairing the energy-intensive cooling systems that are fundamental to human survival and comfort. Drawing on a large sectoral study, here Stanes and colleagues focus on the insights of vocational teachers, who play a crucial role in developing a skilled workforce, amidst structural constraints at the nexus of educational governance, rapidly evolving technologies, and industry needs. Through qualitative interviews, the challenges teachers face in delivering good educational outcomes become clear - outdated and overcrowded curricula, time-consuming compliance processes, and inadequate support networks. In response, teachers have developed their own networks for sharing information and professional development, effectively 'patching a gap' in preserving and developing trade knowledge. The question remains of how sustainable this 'patching' is, for a largely invisible trade on the front line of decarbonisation and energy transitions across many sectors, including the global food chain, agriculture, medicine, and the built environment.

Chapter 4, by social scientists Ben Lyall and Sarah Pink, explores another empirical case study, this time examining forms of "quiet sustainability" in the construction industry. In a sector where change is often imagined as technologically or financially driven at scale, the authors shine a light on individual practices in manual trades. Lyall and Pink's detailed accounts of the work practices of an independent designer/builder and a vocational educator reveal values centred on 'doing more with less'. This ethos is enacted through the practical work of exploring innovative materials, developing localised reuse strategies, and adopting passive design principles that respond to local climate and context. Lyall and Pink focus on the 'everydayness' of this work, showing how skilled tradespeople amplify their 'quiet sustainability' through ongoing

interactions with colleagues, suppliers, educators and apprentices. This provides an important counter-perspective on where sustainability might be located, and the capacity of small-scale practices to reshape this carbon-intensive sector.

Rounding out the first section on skills and training, in Chapter 5 interdisciplinary design scholar Jesse Adams Stein examines questions of skill and flexible capacities through a different lens, drawing on oral history research with practitioners who span creative and industrial sectors. Stein uses the terms "creative technicians" and "technical creatives" to describe workers who embody diverse skillsets, often drawing skills and knowledge across occupational boundaries as they shift between designing and making. While acknowledging this flexibility often stems from the precarity deeply embedded in neoliberalised 'creative industries', Stein argues that there are valuable lessons for other contexts. In an era of climate change, technological change, and geopolitical instability, Stein provocatively shows how conventional categories of occupation, skill and education are no longer fit for purpose. Instead, Stein invites us to consider what capacities people already have, when we take the time to listen to their stories of employment and training.

On Part II: industrial transformation

In Part II: *Industrial Transformation*, we turn our attention to the industrial and technological transitions that characterise the global imperative to decarbonise. This section contributes sectoral case studies covering a range of carbon-intensive industries, including coal mining, construction, and manufacturing. Importantly, it also advances key theoretical debates around how law – specifically industrial relations and labour law, and occupational health and safety frameworks – might be used to advance climate change response in different ways.

The first of these critical theoretical contributions is the aforementioned chapter by Flanagan, who in Chapter 6 raises important questions about the adequacy of existing just transitions frameworks for grappling with the existential threat climate change presents to workers. In proposing a more specific "just cessation" statement be added to the transition frameworks and commitments used by national and international institutions, Flanagan argues that referring *directly* to fossil fuel phasedown will create firmer boundaries and re-focus transitions frameworks to materially address climate change. Flanagan situates this claim historically, reminding the reader that post-war reconstruction provided an important precedent for the scale of change required to re-orient whole economies and societies away from fossil fuel production. The chapter is also resolutely future-oriented, pointing to institutional legal forms no longer fit for purpose. Flanagan persuasively argues that labour law actively positions workers and environment in opposition,

disincentivising change by protecting work in extractive sectors, and making no provision for employee bargaining on environmental grounds.

Continuing the theme of transitions with an empirical lens, in Chapter 7 Chantel Carr and Natasha Larkin take a geographical perspective, making the case for more place sensitivity in examining coal transitions. They begin with an analysis of the political economy of coal that contextualises Australia's role as a major global exporter. Drawing distinctions between two types of coal (thermal and metallurgical), and two markets (domestic and export), Carr and Larkin explore how these distinctions are rarely made in public and political discourse, yet produce vastly divergent trajectories for Australia's coal mining regions. This broad overview provides important context for their qualitative case study with metallurgical coal miners and households connected with the southern coalfields of NSW. Here they find households who have long negotiated challenging working conditions and the precarity inherent in global commodity cycles, and who piece together information about the future of the sector and their own working futures from a wide range of sources. Carr and Larkin argue that clearer policy direction would help build trust amongst workers in metallurgical coal, enabling households to plan for their futures with more certainty.

In Chapter 8, legal scholars Eugene Schofield-Georgeson, Michael Rawling and Brett Heino offer a pragmatic perspective on addressing climate change through Australia's existing labour law structure. They identify Workplace Health and Safety (WHS) committees as an under-utilised avenue through which workers might address environmental and climate-related issues through strong legal provisions widely available across Australia and the Global North more generally. While acknowledging an historical decline in the use of WHS provisions, Schofield-Georgeson, Rawling and Heino argue that realising the full scope of climate action available to workers through WHS powers, requires stronger legislative support and broader WHS reform. The authors explore how strengthening WHS avenues for worker-led climate action must sit alongside more concerted trade union involvement in environmental issues, as part of a broader strategy for strengthening industrial democracy and ultimately addressing climate change.

In Chapter 9, political economist Elizabeth Humphrys also takes up questions of workplace health and safety in the era of climate change, drawing on qualitative empirical data from her ongoing research with the United Workers Union in Australia. Humphrys highlights the compounding effects of dealing with multiple crises, finding that experiences of high heat in diverse sectors including health, cleaning and home care were further exacerbated by wearing necessary Personal Protective Equipment (PPE) during the Covid-19 pandemic. Humphrys reveals how current WHS frameworks for managing heat stress became inadequate when placed under further pressure by the implementation of Covid-19 protocols. Driven primarily by maintaining productivity

and minimising additional costs, employers failed to mitigate compounded heat impacts placing workers under strain and at risk. Despite rhetoric around shared responsibilities for health and safety, Humphrys argues that power imbalances between employers and workers render climate change adaptation a political process in the workplace, with the potential to reproduce and exacerbate existing vulnerabilities and exploitation.

Chapters 10 and 11 take an oblique but complementary approach to questions of work and climate change, sharing cautionary perspectives on current and future green industrial transitions drawing on other sectors and contexts. In Chapter 10 industrial relations researchers Mark Dean and Daniel Nicholson look at barriers to workforce development through a case study of developing new naval shipbuilding capabilities in Australia. Sovereign manufacturing emerged as a policy concern following the Covid-19 pandemic and has continued to dominate Australia's industrial policy development in response to global geopolitical tensions. Meanwhile, the government is looking to energy transitions and decarbonisation to drive the generation of thousands of new manufacturing jobs, predominantly in regional areas. Drawing on union perspectives, Dean and Nicholson identify the challenges of developing a workforce to deliver new advanced manufacturing capabilities, where the need for upskilling workforces conflicts with employers' motivations to maintain control over labour process. To overcome these barriers and address inefficiencies in upscaling manufacturing and infrastructure development, the authors highlight a critical need for long-term national workforce development strategies. These strategies should be coordinated and integrated across government portfolios including education, skills, industry, and energy/environment, while remaining grounded in place-based skills and labour markets.

Finally in Chapter 11, economic sociologist Tom Barnes takes up questions of transition through a case study that revisits the closure of Australian automotive manufacturing, as a gauge for how workers and industries may respond to looming industrial transitions such as the decarbonisation of energy systems, manufacturing and agriculture. Using longitudinal data on employment outcomes, Barnes finds that thousands of workers elected to stay in the manufacturing sector despite labour market transition programs that discouraged it, on the basis of limited future opportunities. Barnes' analysis draws on the concept of "occupational citizenship" to characterise this attachment to a sector ostensibly in decline, even with the provision of government retraining and placement programs. The implications for green industrial transitions are twofold: first, in terms of workplace skills Australia has retained significant manufacturing capability, even in light of recent sectoral withdrawals such as automotive manufacturing; and second, there is a need to ensure decarbonisation and transitions policy takes account of not only existing occupational skillsets, but also to less obvious factors including connections to existing occupational communities and labour processes.

When read together, the chapters in this collection raise a set of themes that extend beyond individual contributions and beyond climate change, including the risks of critical skills and labour shortages across multiple domains simultaneously, the capacities of workers to deploy their skills beyond narrow sectoral definitions, and the various ways in which neoliberalism continues to challenge working life. Ultimately, the volume reflects a moment where the challenges of climate change cannot be held apart – empirically or analytically – from the many other dimensions re-shaping working lives. The field of practice we establish here is forthright in its interdisciplinarity and its close connectedness to the daily realities of working life. It comes from an understanding that the immense challenges of future work in a climate-changed future involve a deep and applied rethinking of skills, capacities, and frameworks for understanding labour.

Notes

1 Commonwealth of Australia, *Royal Commission into National Natural Disaster Arrangements Report*.
2 Foley, "Australia Leases US Firebombing Aircraft."
3 Räthzel and Uzzell, *Trade Unions in the Green Economy*; Lipsig-Mumme and McBride, *Work in a Warming World*; Räthzel, Stevis and Uzzell (eds), *Palgrave Handbook of Environmental Labour Studies*.
4 Climate Change Authority, "Sector Pathways Review."
5 Johnson et al., "The Invisible Labour of Climate Adaptation."
6 Parsons and Natarajan, "Geographies of Labour."
7 Pearse and Bryant, "Labour in Transition"; Kleinheisterkamp-Gonzalez, "The Case for an Environmental Labor Geography"; Coe, "Towards a Political Ecology of Labour?"
8 Among the work of so many scholars, key moments for labour in twentieth and twenty-first century industrial transformation have been documented in, for example, Braverman, *Labor and Monopoly Capital*, Massey, *Spatial Divisions of Labour*, Piore and Sabel, *The Second Industrial Divide*, Kassler-Harris, *Out to Work*, Sassen, *The Global City*; Munck, *Globalization and Labour*.
9 Again, a comprehensive list of such contributions is limited by space, but see for example: Acker, "Inequality Regimes,"; McDowell, "The Lives of Others"; Mitchell, Marson and Katz, *Life's Work*; Tronto, *Moral* Boundaries; Weeks, *The Problem With Work*; Adkins and Dever, "Gender and Labour in New Times"; Edwards and Wajcman, *The Politics of Working Life*.
10 Alderslade, "Close Calls."
11 Stein and Carr, *All Hands on Deck*.
12 The *All Hands on Deck* project includes two edited collections: this volume, alongside its sibling, Stein and Carr, *Designing Through Planetary Breakdown: Locating Material Knowledge and Practical Skill*.
13 Abram et al. "Just Transition."
14 Denham and Rickards, *Climate Impacts at Work*; Johnson et al., "The Invisible Labour of Climate Change Adaptation."
15 Mazzochi, "An Answer to the Jobs-Environment Conflict"; Stevis et al., *Just Transitions*.
16 See for example: Abram et al. "Just Transition"; Cha, *A Just Transition for All*; Flanagan and Goods, "Climate Change and Industrial Relations." In "The Just

Transition," Velicu and Barca put forward a persuasive case for why the concept *should* extend beyond the wage relation. Newell and Mulvaney take a broad but critical political economic view in "The Political Economy," which is instructive, focusing on equitable energy access and managing contradictions in addressing energy and climate justice simultaneously, alongside justice for fossil fuel workers.

17 International Labour Organisation, *Guidelines for a Just Transition*.
18 Abram et al. "Just Transition,"; Cha, *A Just Transition for All*; Healy and Barry, "Politicizing Energy Justice."; Heffron and McCauley, "What is the Just Transition?"; Snell, "'Just Transition'?"; Weller, "Just Transition?"
19 Parsons and Natarajan, "Geographies of Labour."
20 Velicu and Barca, "The Just Transition."
21 See for example, Carr, "Maintenance and Repair," and Stein, "Masculinity and Material Culture."
22 Lai et al. "A Place-Based Just Transition Framework"; Eadson et al. "Decarbonising Industry"; Stambe et al., "Jobs Aren't Enough."
23 See also: Carr, "Repair and Care."
24 Snell, "Just Transition"; Banerjee and Schuitema, "How Just Are Just Transition Plans?"; Schuster et al., "The Unjust Just Transition?"
25 Pearse and Bryant, "Labour in Transition."
26 Carr, "Maintenance and Repair"; Pearse and Bryant, "Labour in Transition"; Velicu and Barca, "The Just Transition."
27 Legislated net zero commitments are relatively recent in Global North contexts. The United Kingdom became the first major economy to legislate net zero targets by amending the Climate Change Act 2008 in mid-2019 (Climate Change Act 2008, c. 27, as amended by The Climate Change Act 2008 (2050 Target Amendment) Order 2019, SI 2019/1056). This was followed by Canada and the European Union in 2021.
28 Rickards et al., "Australia's National Climate."
29 Denham et al., "The Jobs of Climate Adaptation."
30 See Lai et al., "A Place-Based Just Transition Framework,", though what we are referring to here extends beyond their approach to incorporate not only adaptation planning, but also intersecting infrastructural needs – housing, education, transport and social services – which are also an essential part of transition planning.
31 Denham et al., "The Jobs of Climate Adaptation."
32 Pearse and Bryant, "Labour in Transition."
33 This attentiveness to our own context might be deemed unnecessary by some, though we note that when publishing in international journals – often based in other Global North countries – Antipodean researchers are commonly asked to justify the 'global' relevance of our work.
34 This was to include a federal Environmental Protection Agency.
35 Climate Council, "State of Queensland."

Bibliography

Abram, Simone, Ed Atkins, Alix Dietzel, Kirsten Jenkins, Lorna Kiamba, Joshua Kirschner, Julia Kreienkamp, Karen Parkhill, Tom Pegram and Lara M. Santos Ayllón. "Just Transition: A Whole-Systems Approach to Decarbonisation." *Climate Policy* 8 (2022): 1033–49.

Acker, Joan. "Inequality Regimes: Gender, Class and Race in Organisations." *Gender & Society* 20, no. 4 (2006): 441–64.

Adkins, Lisa and Maryanne Dever. "Gender and Labour in New Times: An Introduction." *Australian Feminist Studies* 29, no. 79 (2014): 1–11.

Liz, Alderslade. "Close Calls for Aged Care Facilities in Bushfire Zone." *Talking Aged Care*. 17 January 2020. https://www.agedcareguide.com.au/talking-aged-care/close-calls-for-aged-care-facilities-in-bushfire-zones

Banerjee, Aparajita and Geertje Schuitema. "How Just are Just Transition Plans? Perceptions of Decarbonisation and Low-Carbon Energy Transitions Among Peat Workers in Ireland." *Energy Research & Social Science* 88 (2022): 102616.

Braverman, Harry. *Labor and Monopoly Capital: The Degradation of Work in the 20th Century*. Monthly Review Press, 1974.

Carr, Chantel. "Repair and Care: Locating the Work of Climate Crisis." *Dialogues in Human Geography* 13, no. 2 (2022): 221–39.

Carr, Chantel. "Maintenance and Repair Beyond the Perimeter of the Plant: Linking Industrial Labour and the Home." *Transactions of the Institute of British Geographers* 42, no. 4 (2017): 642–54.

Cha, J. Mijin. *A Just Transition for All: Workers and Communities for a Carbon-Free Future*. MIT Press, 2025.

Climate Change Act 2008, c. 27, as amended by The Climate Change Act 2008 (2050 Target Amendment) Order 2019, SI 2019/1056. https://www.legislation.gov.uk/uksi/2019/1056/contents/made

Climate Change Act 2022 (Cth) No. 37, 2022. https://www.legislation.gov.au/Details/C2022A00037

Climate Change Authority. "Sector Pathways Review." 3 October 2024. https://www.climatechangeauthority.gov.au/sector-pathways-review

Climate Council. *State of Queensland: Disaster Ground Zero*. 9 October 2024. https://www.climatecouncil.org.au/resources/state-of-queensland-disaster-ground-zero/

Coe, Neil. "Afterword: Towards a Political Ecology of Labour?" *Area* 53 (2021): 450–53.

Commonwealth of Australia. *Royal Commission into National Natural Disaster Arrangements Report*, 2020.

Copernicus Climate Change Service (C3S). *Global Climate Highlights 2024*. 10 January 2025. https://climate.copernicus.eu/global-climate-highlights-2024

Denham, Todd and Lauren Rickards. *Climate Impacts at Work: Supporting a Climate Ready Workforce*. Climate Resilience Living Lab, RMIT University, 2022.

Eadson, Will, Bregje van Veelen and Stefan Backius. "Decarbonising Industry: A Places-of-Work Agenda." *The Extractive Industries and Society* 15 (2023): 101307.

Edwards, Paul and Judy Wajcman. *The Politics of Working Life*. Oxford University Press, 2005.

Environment Protection and Biodiversity Conservation Act 1999 (Cth) No. 91, 1999. https://www.legislation.gov.au/Details/C2024C00598

Flanagan, Frances and Caleb Goods. "Climate Change and Industrial Relations: Reflections on an Emerging Field." *Journal of Industrial Relations* 64, no. 4 (2022): 479–98.

Foley, Mike. "Australia Leases US Firebombing Aircraft in the Winter. So What Happens when LA Burns in January?" *Sydney Morning Herald*, 9 January, 2025. https://www.smh.com.au/politics/federal/fire-seasons-are-becoming-a-constant-global-threat-this-may-leave-australia-on-its-own-20250109-p5l30j.html

Future Made in Australia Act 2024 (Cth). https://www.legislation.gov.au/Details/C2024A00119

Healy, Noel and John Barry. "Politicizing Energy Justice and Energy System Transitions: Fossil Fuel Divestment and a 'Just Transition.'" *Energy Policy* 108 (2017): 451–9.

Heffron, Raphael and Darren McCauley. "What is the Just Transition?" *Geoforum* 88 (2018): 74–7.

International Labour Organisation. *Guidelines for a Just Transition Towards Environmentally Sustainable Economies and Societies for All*. ILO (2015). https://www.ilo.org/publications/guidelines-just-transition-towards-environmentally-sustainable-economies

Johnson, Leigh, Michael Mikulewicz, Patrick Bigger, Rithodi Chakraborty, Abby Cunniff, Joshua Griffin, Vincent Guermond, Nicole Lambrou, Megan Mills-Novoa, Benjamin Neimark, Sara Nelson, Costanza Rampini, Psang Sherpa and Gregory Simon. "The Invisible Labour of Climate Change Adaptation." *Global Environmental Change* 83 (2023): 102769.

Kessler-Harris, Alice. *Out to Work: A History of Wage-Earning Women in the United States*. Oxford University Press, 1982.

Kleinheisterkamp-Gonzalez, Nicole. "The Case for an Environmental Labor Geography: The Role of Organised Labor in the Climate Crisis." *Progress in Human Geography* 47, no. 2 (2023): 317–32.

Lai, Huei-Ling, Patrick Devine-Wright, Jo Hamilton, Sarah Mander, Diarmaid Clery, Imogen Rattle, Abigail Martin, Stacia Ryder and Peter Taylor. "A Place-Based, Just Transition Framework can Guide Industrial Decarbonisation with a Social Licence." *Energy Research & Social Science* 121 (2025): 103967.

Lipsig Mumme, Carla and Stephen McBride. *Work in a Warming World*. Queens University Press, 2015.

Massey, Doreen. *Spatial Divisions of Labour: Social Structures and the Geography of Production*. Palgrave MacMillan, 1984.

Mazzocchi, Tony. "An Answer to the Jobs-Environment Conflict?" *Green Left Review*, 8 September 1993. https://www.greenleft.org.au/content/answer-jobs-environment-conflict

McDowell, Linda. "The Lives of Others: Body Work, the Production of Difference, and Labor Geographies." *Economic Geography* 91, no. 1: 1–23.

Mitchell, Katharyne, Sallie Marston and Cindi Katz. *Life's Work: Geographies of Social Reproduction*. Wiley-Blackwell, 2004.

Munck, Ronaldo. *Globalisation and Labour: The New "Great Transformation"*. Zed Books, 2002.

Newell, Peter and Dustin Mulvaney. "The Political Economy of the 'Just Transition'." *The Geographical Journal* 179, no. 2 (2013): 132–40.

Net Zero Economy Authority Act 2024 (Cth) No. 85, 2024. https://www.legislation.gov.au/Details/C2024A00085

Offshore Electricity Infrastructure Act 2021 (Cth) No. 120, 2021. https://www.legislation.gov.au/Details/C2025C00179

Parsons, Laurie and Nithya Natarajan. "Geographies of Labour in a Changing Climate." *Area* 53, no. 3 (2021): 406–12.

Pearse, Rebecca and Gareth Bryant. "Labour in Transition: A Value-Theoretical Approach to Renewable Energy Labour." *Environment and Planning E: Nature and Space* 5, no. 4 (2021): 1872–94.

Piore, Michael and Charles Sabel. *The Second Industrial Divide: Possibilities for Prosperity*. Basic Books, 1986.

Räthzel, Nora, Dimitris Stevis and David Uzzell. (eds.) *Palgrave Handbook of Environmental Labor Studies*. Springer International Publishing, 2021.

Räthzel, Nora and David Uzzell, eds. 2013. *Trade Unions in the Green Economy: Working for the Environment*. Routledge.

Rickards, Lauren, Timothy Neale and Matthew Kearnes. "Australia's National Climate: Learning to Adapt?" *Geographical Research* 55, no. 4 (2017): 469–76.

Sassen, Saskia. *The Global City: New York, Lonfon, Tokyo*. Princeton University Press, 2001.

Schuster, Antonia, Maksymilian Zoll, Ilona Otto and Franziska Stölzel. "The Unjust Just Transition? Exploring Different Dimensions of Justice in the Lignite Regions of Lusatia, Eastern Greater Poland, and Gorj." *Energy Research & Social Science* 104: 103227.

Snell, Darryn. "'Just Transition'? Conceptual Challenges Meet Stark Reality in a 'Transitioning' Region in Australia." *Globalizations* 15, no. 4 (2018): 550–64.

Stambe, Rose-Marie, Greg Marston, Darryn Snell and Jeremy Moss. "Jobs Aren't Enough: Redefining Just Transitions in Australia with Community Voices." *Energy Research & Social Science* 122 (2025): 103999.

Stein, Jesse Adams. "Masculinity and Material Culture in Technological Transitions in the Workplace: From Letterset to Offset-Lithography, 1960s–1980s." *Technology & Culture* 57, no. 1 (2016): 24–53.

Stein, Jesse Adams and Chantel Carr, eds. *Designing through Planetary Breakdown: Locating Material Knowledge and Practical Skill*. Routledge, 2025.

Stein, Jesse Adams and Chantel Carr. *All Hands on Deck*. Sydney, 2023. https://allhandsondeck2023.com/

Stevis, Dimitris, Edouard Morena and Dunja Krause. "Introduction: The Genealogy and Contemporary Politics of Just Transitions." In *Just Transitions: Social Justice in the Shift Towards a Low-Carbon World*, edited by E. Morena, D. Krause and D. Stevis. Pluto Press, 2020.

Tronto, Joan. *Moral Boundaries: A Political Argument for an Ethic of Care*. Routledge, 1993.

Velicu, Irina and Stefania Barca. "The Just Transition and its Work of Inequality." *Sustainability: Science, Practice and Policy* 17, no. S2 (2020): 263–73.

Weeks, Kathi. *The Problem with Work: Feminism, Marxism, Antiwork Politics and Postwork Imaginaries*. Duke University Press, 2011.

Weller, Sally. "Just Transition? Strategic Framing and the Challenges Facing Coal Dependent Communities." *Environment and Planning C: Politics and Space* 37, no. 2 (2019): 298–316.