

RESEARCH ARTICLE



WILEY

The energy-extractives nexus and the just transition

Nicholas Bainton¹ | Deanna Kemp¹ | Eleonore Lèbre¹ | John R. Owen¹ | Greg Marston²

¹Centre for Social Responsibility in Mining, The University of Queensland, St Lucia, Queensland, Australia

²School of Social Science, The University of Queensland, St Lucia, Queensland, Australia

Correspondence

Nicholas Bainton, Centre for Social Responsibility in Mining, The University of Queensland, St Lucia, QLD 4072, Australia.
Email: n.bainton@uq.edu.au

Funding information

The University of Queensland

Abstract

The concept of a 'just transition' to a low-carbon economy is firmly embedded in mainstream global discourses about mitigating climate change. Drawing on Karl Polanyi's political economy elaborated in *The Great Transformation*, we interrogate the idea of a just transition and place it within its historical context. We address a major contradiction at the core of global energy transition debates: the rapid shift to low-carbon energy-systems will require increased extraction of minerals and metals. In doing so, we argue that extractive industries are energy and carbon-intensive, and will enlarge and intensify social and ecological injustice. Our findings reveal the importance of understanding how the idea of a just transition is used, and by who, and the type of justice that underpins this concept. We demonstrate the need to ground just transition policies and programmes in a notion of justice as fairness.

KEYWORDS

Capitalocene, climate change, coal phase out, energy policy, low-carbon economy, renewable energy

I get to have the benefits of air conditioning and air travel and all the other environmentally expensive amenities that the prime victims of climate change will not have. And the same holds for the overlapping case of global economic justice. 'The Beneficiary' (Robbins, 2017)

1 | INTRODUCTION

Karl Polanyi's classic work *The Great Transformation* provides a template for understanding major points of epochal change. The proliferation of proposals for transitioning to a low-carbon economy implies, to a greater or lesser extent, a major paradigmatic transformation in the Polanyian sense (e.g., Kanger & Schot, 2019). This thinking is beginning to settle around the concept of a 'just transition', which originally emphasised labour and environmental interests and is now broadly conceived as an approach for balancing socio-economic and ecological considerations in response to climate

change. We might therefore say that our current ecological crisis is subject to what Polanyi called a 'double movement': where steps taken towards the partial or complete resolution of a crisis are continually counter-balanced by forces that created the crisis in the first place. The concept of a just transition forms part of the many movements in the dynamics of industrial capitalism. But as we observe, there are both modest and radical versions of the just transition concept and there is limited consensus as to what a process of transition should or might entail and who should be responsible for this change.

In this article, we address a major contradiction at the core of energy transition discourse and debate: building low-carbon energy-systems to power a low-carbon economy will require vast amounts of minerals and metals. Meeting this future demand will mean more energy and carbon-intensive forms of resource extraction, which will likely enlarge and intensify geographies of injustice. The meaning of a just transition is explored in the context of expanding extractive capitalism – we question what is 'just' about the transition given the

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2021 The Authors. *Sustainable Development* published by ERP Environment and John Wiley & Sons Ltd.

current and future costs of delivering on global emissions targets. As the just transition discourse rises in popularity, and shapes climate and energy policies, tracing both its history and future development will be important. Understanding how the idea is used, and by who, matters a great deal as we interrogate who bears the burden and shares the benefits of a global energy transition.

2 | DOUBLE MOVEMENTS AND THE POLITICAL ECONOMY OF THE CAPITALOCENE

When Polanyi wrote *The Great Transformation* he set out to describe the social and political upheavals that accompanied the rise of capitalism, or what he called market society (Polanyi, 2001[1944]). He aimed to show how market societies are constituted by opposing forces, which he described as a double movement. As different constituencies have attempted to expand the scope and influence of 'self-regulating' markets, protective counter-movements have emerged to insulate society from destructive market forces.¹ Polanyi's primary objective was to expose the idea of a purely self-regulating market as a utopian vision – to show how the market economy has been built on a foundation that necessitates the constant intervention of the state.

This argument rests upon his famous account of 'real' and 'fictitious' commodities. Polanyi reasoned that if commodities are produced for sale on the market, then labour, land and money – the core components of an industrial economy – must count as false commodities since they are not actually 'produced' for sale in the conventional sense. The markets in these things are, therefore, inherently unstable and Polanyi thought that since the power of the state is required to maintain the stable supply and demand of these 'commodities', then such power could also be used to counter their harmful impacts on society and the environment – a point that we return to in our concluding comments.

In the case of the global mining industry, states plan, regulate and enable extraction. According to Tim Jackson, states are also legally and morally obligated to protect the public good, and the natural environment and citizen interests, hence his apt description of the 'conflicted state' in the context of one step forwards and two steps backwards climate change mitigation and adaptation (Jackson, 2009). While the regulatory strength of some advanced neoliberal states has certainly declined, in each context we find that states also directly intervene to guarantee the supply of these commodities (Bainton & Skrzypek, 2021). This occurs in a range of strategic and punitive ways, for example, through policies and legislation to attract developers, so that extractive capital might accumulate in some places and not others (Bridge, 2004), and by deregulating labour markets to enable companies to appropriate cheap labour-power. It also occurs through spatial strategies to open up land and facilitate resource extraction, or what can be understood as acts of dispossession and 'territorialisation' (Vanderveest & Peluso, 1995), creating land boundaries and the allocation of resource rights to so-called private actors.

Polanyi anticipated many of the arguments that now sit at the centre of contemporary socio-environmental movements: that

unregulated markets work to convert humans and the natural environment into commodities, which assures their destruction. He wanted to reveal the effects of subordinating nature and society to the market and to chart a new direction to stop entropic drift and 'improve our chances of survival' (Polanyi, 1977, p. 43). Developments over the last half-century have vindicated this analysis. Runaway global processes have pushed humanity – and the rest of life on Earth – to the threshold of a 'state shift'. As Earth scientists plainly put it, we are now living through a change process that has the potential to 'transform Earth rapidly and irreversibly into a state unknown in human existence' (Barnosky et al., 2012, p. 52).

Scholars have forcefully argued that we are living in the 'age of capital' or the 'Capitalocene' – a distinct historical epoch beginning in the 15th century, which is shaped by the seemingly endless accumulation of capital (e.g., Moore, 2017, 2018; see also Malm, 2016; Ruccio, 2017). For our purposes, the idea of the Capitalocene – which Jason Moore admits is 'an ugly term for an ugly system' – refers to the creativity and destructiveness of capitalism, which imposes a relentless pattern of violence and inequality maximising moves in the 'web of life' as part of a larger repertoire of strategies that 'put nature to work' (Moore, 2016, p. 5).²

The contemporary conditions of the Capitalocene have precipitated a variety of 'transition discourses'. They can be understood as a direct response to securing new and expanded supplies of food, labour, energy and raw materials – what Moore calls the 'four cheaps'. This idea refers to the way the capitalist system organises nature, and assigns value to some work and some lives, while excluding others (Moore, 2017, p. 600). In general terms, contemporary transition discourses share a common concern about the social and ecological pressures exerted by neoliberal globalisation (Haberl et al., 2011). Most of these discourses posit the need for a profound cultural, economic and political transformation of dominant institutions and practices (Escobar, 2015): in other words, they argue that we need a counter-movement of sufficient scale and strength to alter the course of history.

3 | ENTER, THE 'JUST TRANSITION'

These discourses have most recently coalesced around the concept of a just transition, which has been defined as 'a fair and equitable process of moving towards a post-carbon society' (McCauley & Heffron, 2018, p. 2). The concept first originated within United States labour environmentalism in the 1970s and 1980s, and was later 'globalised' through the agency of national and global labour unions and environmental justice groups.³ Just transition has served as a mobilising term for promoting 'green jobs' as a necessary component of the transition away from fossil fuels, and now encompasses a range of interventions needed to secure the rights and livelihoods of workers and communities in the shift to cleaner forms of production. It has been adopted by the International Trade Union Confederation (ITUC) and backed by the International Labour Organisation. For the ICTU, society must confront the realities of global environmental

inequalities reflected in the uneven geographical distribution of carbon-intensive economies and climate-vulnerable communities. More specifically, any viable solution must recognise how labour is placed globally in relation to climate change and energy needs. Broadly speaking, the concept conveys a belief that the burdens of climate action should not be borne by one set of workers or communities or by any one country, encapsulating a geographical perspective on the social distribution of the costs and benefits linked to energy transitions (Jenkins et al., 2020). For some groups, the concept of a just transition also encompasses issues of Indigenous rights and environmental justice. For example, the US-based Indigenous Environmental Network argue that a just transition must confront 'a legacy of exploitation, ecocide and environmental, energy, climate and economic injustice' (IEN, 2020).

The rising popularity of the idea signals a growing awareness about deepening inequalities between the rich and poor of the world (Alston, 2020; Bainton & McDougall, 2021), and how the climate and environmental crises, and efforts to address them, are accentuating these inequalities (Jasanoff, 2018; Stevis et al., 2019, p. 4; Svobodova et al., 2020). Over the past decade, the concept of a just transition has been mainstreamed within the United Nations and throughout a range of other international, multi-national, national and sub-national policy frameworks. It has been incorporated into the language of national union movements and policymakers and the remit for various non-government organisations. Politically it received its most significant endorsement when it was included in the preamble to the 2016 Paris Climate Agreement (UNFCCC, 2016). The idea was then reinforced at COP24 (2018) in Katowice, Poland, through the Silesia Declaration, which stresses that:

a just transition of the workforce and the creation of decent work and quality jobs are crucial to ensure an effective and inclusive transition to low greenhouse gas emission and climate resilient development, and to enhance the public support for achieving the long term goals of the Paris Agreement. (UNCCC, 2018)

These sentiments are echoed in the popular push for a 'Green New Deal' (Klein, 2019) that calls for a rapid move to a carbon-neutral economy through a fair and just transition for communities and workers, which includes creating decent jobs and addressing the historic discrimination of frontline and vulnerable communities, and recognising the needs of Indigenous peoples and the environmental justice movement. The concept presents as a counter to a resurgent 'jobs vs environment' discourse by foregrounding the interests of labour in the transition to a decarbonised economy. However, in practice, there is a yawning gap between the narrow understanding of a transition found among some climate policymakers and the multi-dimensional reality of a living concept, which originated in the everyday experiences of frontline workers, communities and labour unions (Cha, 2020). As a result, the definition, scope and scale of this concept range from a modest claim for jobs in the 'green economy' to a radical and alternative global vision that replaces extractive capitalism and expanding militarism and imperialism with a 'civilising globalisation'.

Similar to earlier debates around the meaning of sustainable development (Connelly, 2007) – especially in relation to the use of this term by the extractive industries – it certainly appears that just transition will become a contested and potentially vacuous concept. Contestation will likely increase as various policy actors from the labour movement, ecological economists, corporations, Green political parties and activists use the term at the ideational level of policy change, investing it with their own vision of what constitutes a transition from one state to another. One of the catchcries of the labour movement, for example, is that there will be a transition, but there is no guarantee it will be just. We anticipate that some extractive corporations will appropriate the term just transition as a way of countering negative public sentiment or in an effort to mobilise consent and promote a hollowed-out understanding of justice. As we argue below, the just transition concept could soon become another 'empty signifier', linking together a range of demands and differences, thus limiting the possibility of contestation (Laclau, 1996).

4 | CORPORATE ENCLOSURE AND CONCEPTUAL APPROPRIATION

A cursory mapping of the members of the International Council of Mining and Metals indicates that very few major mining companies have, as yet, opined upon or engaged with the concept of a just transition (the term does not feature on their websites or in their policies or public reports).⁴ Over the past 3 years, of the 27 member companies, only three refer to just transition in terms of *potential* moves away from thermal coal, or to signal commitment to minimise social and economic impacts when decarbonising emissions intensive facilities.⁵ For example, in response to questions about future investments, Anglo American Chief Executive, Mark Cutifani, recently stated 'When we talk about a transition, we've halved our footprint in thermal coal in the last five years and we call it a just transition' (Anglo American, 2018). The following year he elaborated upon this claim:

On thermal coal, in the last three years we have reduced our footprint by 50%. The thermal coal assets have the shortest life in our portfolio and that we are unlikely to be investing in new thermal coal projects. So, thermal coal, while still important, is reducing in significance across the portfolio. We look for a *just transition* making sure that we are working with the government, working with customers, working with communities, working with employers. (Anglo American, 2019 emphasis added).

When used this way, just transition displays 'corporate social responsibility' credentials to reassure investors and frame their commitments to communities and workers. The captains of the industry, it seems, are testing the waters, anticipating pressure from investors and other stakeholders to articulate a 'position' and demonstrate their alignment or justify their departure from the mainstream.

As Peter Bensen and Stuart Kirsch have observed, corporations regularly respond to critique by co-opting the discourse of their critics (Bensen & Kirsch, 2010). Examples of these strategic manoeuvres abound, with corporations readily appropriating the language of 'social responsibility', 'community development' and 'sustainability' in forms that fundamentally transform their meaning. In other instances, we find that mining companies merely 'parrot' these terms, reflecting back to shareholders the language they expect to hear. Kirsch argues that discursive shifts – like the development and deployment of corporate oxymorons such as 'clean coal', 'sustainable mining' or 'green steel' – obscure the fact that there have been very few significant reforms to the practices of mining over the past half-century, which the term 'sustainable' might imply (Kirsch, 2009, p. 92).

Like sustainability, just transition is a perfect example of what linguistic anthropologists call a 'strategically deployable shifter' (Kirsch, 2009; Urciuoli, 2008). Shifters refer to words or expressions used across different fields of discourse in ways that are formatively similar, but with different social implications. Their referential value depends upon the context: in what appear like ordinary acts of reference involving terms with simple, obvious denotation, people establish or reproduce value-laden social alignments and identities (Urciuoli, 2010, p. 168). The use of shifters is a routine practice in religious or political discourse, and it is increasingly common in corporate discourse. The range of competing meanings ascribed to the idea of a just transition – by different actors and sections of society, including states and corporations, unions, multilateral organisations, civil society, scholars and activists – indicates that it has already become a strategically deployable shifter where the scope, scale and strength of the term depend upon how it is deployed and by whom.

As the just transition concept becomes further embedded in mainstream political and environmental discourse, we expect that mining companies will aim to harness the reputational benefits associated with the use of the term. As a shifter, different constituencies have shrunk, stretched and reinterpreted the meaning of the term over its definitional career. The term has effectively been 'loosened up' for broad uptake. Several types of corporate effect are anticipated. Some 'enlightened corporations' may signal their support for the idea – maximising the symbolic capital accompanying the term – without necessarily enacting meaningful changes to their practices. Alignment with the concept may provide ethical justification for companies to extend their interests into the energy transition metals market (a point we discuss further below). Others may use this as a pretext to drop old assets or to move away from thermal coal – in what is otherwise a financial risk management strategy as fund managers signal their intention to divest from fossil fuels. While some companies simply sell ageing or problematic assets to avoid the costs and liabilities of closure (Bainton & Holcombe, 2018).

It appears that most major mining companies acknowledge that an energy or an ecological transition is underway – even if they have not fully considered the justice issues accompanying these transition processes. For example, on their websites, and in their public reports and policy statements, the vast majority of the world's major mining companies use the term 'transition' when discussing 'a low-carbon economy',

'climate change', 'being carbon-neutral by 2050', moving to 'a 2 degree Celsius world', 'Transition Pathway Initiatives', 'clean energy', 'green growth' and 'renewable energy'. Many promote themselves as essential actors in the transition to a low-carbon future. Consider recent statements from two of the world's largest companies:

As one of the world's largest diversified resource companies, Glencore has a key role to play in enabling transition to a low-carbon economy. We do this through our well-positioned portfolio that includes copper, cobalt, nickel, vanadium and zinc – commodities that underpin energy and mobility transformation, for example through batteries for electric vehicles. We believe this transition is a key part of the global response to the increasing risks posed by climate change...To deliver a strong investment case to our shareholders, we must invest in assets that will be resilient to regulatory, physical and operational risks related to climate change. (Glencore, 2020).

...the materials that Rio Tinto produces have a significant role to play in supporting the transition to a low-carbon economy. Beyond the implications for the future demand of our products, we also need to consider potential shifts in industry structure and the competitive position of our assets to develop a deeper understanding of our portfolio's resilience in a carbon-constrained world. (Rio Tinto, 2018).

As companies adopt the language of transitioning, they are simultaneously positioning themselves as critical to the success of energy transitions, pre-empting their critics, and reassuring their shareholders of their values. The question is whether they will also engage the harm and the environmental costs of this transition. How companies use the just transition term will require careful interrogation. Just transition could provide another platform for corporate 'tourneys of virtue' where companies compete to profile their 'good deeds' (Bainton et al., 2020). Indeed, if the appropriation and re-signification of language by corporations is fundamental to the ways they embed themselves in society, then it seems very likely that some mining companies will appropriate the term and associated phrases in ways that are consistent with a broader strategy of 'accumulation by appropriation' (Moore, 2018) or what we call 'corporate enclosure' where private companies appropriate and enclose a public discourse to exclude alternative meanings and uphold the hegemony of the state-industrial mining complex.

5 | ENERGY TRANSITION METALS IN THE ENERGY-EXTRACTIVES NEXUS

As public consensus builds about the need to transition to a low-carbon economy, a simple grand narrative has helped to hasten and validate the political momentum of this movement. The narrative runs something like

this: continued use of fossil fuels is bad for the environment, therefore, we must transition to low-carbon energy-systems as soon as possible. This narrative has produced two conjoined effects. First, a good deal of public discourse – especially in post-industrial societies in the global North – has focussed overwhelmingly on the contested role of thermal coal. On one side of the political spectrum, coal is synonymous with a regressive past, and divestment in coal extraction is therefore a win for progressive environmental movements and taken as evidence of an inevitable shift towards renewable energy-systems. On the other side, pro-coal proponents argue that contemporary economies cannot function without coal, and in its extreme manifestations, this has fuelled forms of ‘climate change denialism’ on the political right. Second, the focus on coal (and renewable energy) has meant that the concept of a just transition is most commonly associated with restoring jobs and livelihoods for workers being phased out of sunset industries (Mayer, 2018). This teleological narrative, which leaps from divestment in coal to investment in clean energy technology, ignores the difficult questions surrounding the sourcing and supply of minerals and metals required to support renewable energy-systems in a low-carbon economy.

Regardless of the technological pathway, decarbonising the economy will involve greater quantities of metals and therefore an intensification of mining activities. There is likely to be an increased demand for more than 20 metal commodities to facilitate the energy transition (Church & Crawford, 2018). These metals, which can be classed as ‘energy transition metals’ (ETMs), include specialty metals needed for their unique properties in specific technologies, and bulk commodities required for a broad range of uses in energy generation, transmission and storage infrastructure.

To illustrate this point, Figure 1 shows peak energy transition demand projections (in kilo tonnes), and as a percentage of global production. For specialty metals like lithium, cobalt and rare earths, the energy transition is expected to trigger unprecedented demand that will be several times higher than current global levels. Whereas demand for major metals like iron, aluminium, copper and nickel will

be significantly higher in terms of absolute tonnage values than the demand for specialty metals (Lèbre et al., 2020). Although these tonnages represent a fraction of the current global demand for these major metals, they are in addition to an already high demand stemming from other sectors. Non-metallic resources will also need to be supplied, such as coking coal that is used in the steel making process.

Heightened demand for mineral resources translates into more mines with larger and deeper footprints, which in turn place greater pressure on the social and environmental contexts in which these activities occur. Metal ores tend to be concentrated in specific regions of the world (IRP, 2019). Many of these regions are ‘resource cursed’ in the sense that they are both resource-dependent and characterised by endemic governance challenges (IRP, 2020; Ross, 1999). A significant proportion of mining operations are located in ‘fragile’ states that perform poorly on key social and political indicators such as conflict, poverty, corruption, inequality and freedoms (Lèbre et al., 2019; FFP, 2018). At the local level, mining exacerbates pre-existing vulnerabilities through changes that deeply alter land, land relations, livelihoods and natural habitats (e.g., Bainton et al., 2018; Jacka, 2015; Voyles, 2015), which can in turn generate violent conflict (e.g., Bebbington, 2012; Le Billon, 2014). While it may be deemed an essential sector and supplier of ETMs, the mining industry is also a generator of profound social and environmental risks and harm.

The global distribution of mines requires that we think about mining-related risks and harms as ‘situated’ (Owen et al., 2020). These risks and harms are generated through complex interactions between a mining project and environmental, social and governance factors that are particular to a geographic context. Recent research has demonstrated the prevalence of social and environmental risks across the future stock of undeveloped copper orebodies (Valenta et al., 2019), and the co-occurrence of these same risks across both undeveloped and operating projects for nine key ETMs (Lèbre et al., 2020).

An intensification of mining activities to meet future energy demand will likely reinforce these risks in current mining regions as

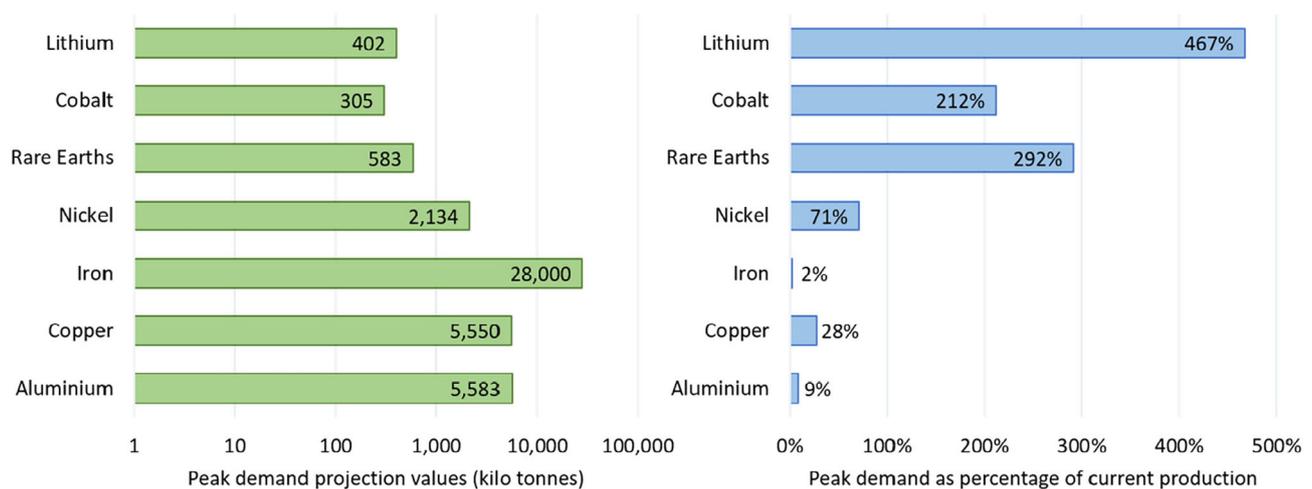


FIGURE 1 Global demand for energy transition minerals. Left: The projected peak demand associated with global demand for low-carbon energy technologies (kilo tonnes). Right: The projected peak demand as a percentage of current global production.

Source: adapted from Lèbre et al. (2020); based on median values [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com)]

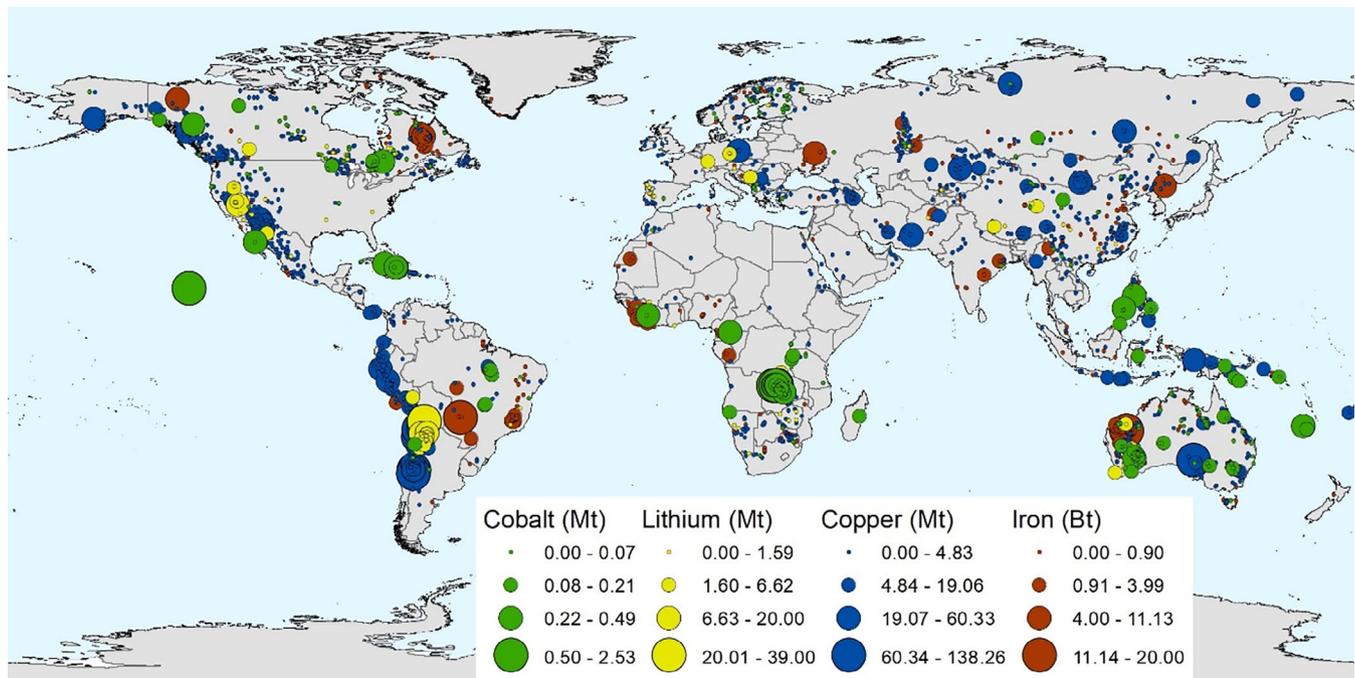


FIGURE 2 Location of operating projects and undeveloped orebodies, classified by the amount of contained metals in reserves and resources. Mt: million tonnes. Bt: billion tonnes.

Source: compiled by the authors from S&P Global Market Intelligence data sets (S&P Global, 2020) [Colour figure can be viewed at wileyonlinelibrary.com]

well as in new mining frontiers (see Figure 2). The exponential growth in exploration and extraction of specialty metals will bring the environmental and social risks embedded in mining contexts to regions where these undeveloped orebodies are located. The presence of multiple concurrent technical, and environmental and social risks in a high proportion of mining contexts could also result in restricting global supply – ultimately delaying the transition towards a low-carbon economy.

The need for a greater volume of ETMs to mitigate climate change points to a complex energy-extractives nexus. First, the increased extraction of ETMs will require greater amounts of energy. Second, as ore grades decline, the energy cost of extracting and processing ETMs will increase. This raises questions about the gross composition of anticipated environmental gains (York & Bell, 2019). Low-carbon energy-systems have a higher material intensity, and their associated greenhouse gas emissions are a fraction of those associated with fossil fuel systems (Hund et al., 2020). However, the production of ETMs for these systems comes at a significant energy and emissions cost. Low-carbon energy and storage technologies could generate around 16 billion tonnes of carbon dioxide equivalent (CO₂e) emissions by 2050, of which a significant proportion stems from the production of ETMs (Azadi et al., 2020; Hund et al., 2020).⁶

In addition, the energy cost of extracting and processing ETMs may well be higher than anticipated due to declining ore grades. The observed decrease in ore grades is expected to continue as higher-grade deposits are exhausted. As a basic rule, lower grades require more resources to extract the same amount of metal. For example, when

comparing a 3% copper grade to a 0.5% copper grade, energy requirements for mining and mineral processing are multiplied by six (Norgate & Haque, 2010). Lower grades can also result in larger amounts of mine waste and a markedly larger mine footprint (Mudd, 2010). The exploitation of lower-grade deposits would add pressure on host contexts, and result in more energy intensive forms of mining and processing (Northey et al., 2018). Taken as a whole, this nexus highlights the need to engage critically with transition narratives, and more specifically, to consider the distribution of benefits and burdens that will accompany a transition towards low-carbon energy-systems.

6 | JUSTICE AND JUSTIFICATION

This daunting transition forecast brings the question of justice firmly into view. It emphasises the social and spatial dimensions of the political economy of transition (Newell & Mulvaney, 2013), raising numerous unresolved questions that persist in the current order of things: how will the transition proceed, who benefits and who carries the burden (and how is any difference reconciled), what kinds of unforeseen benefits and harms will emerge through the processes of administrating change, and how do we deal with the injustices we already have?

Mainstream definitions that focus on jobs in the green economy are simply not equipped to deal with these types of questions at-scale. More expansive versions of the just transition concept suggest a transitional process that seeks fairness and equity with regards to concerns such as wealth, energy, gender, race, human rights and

climate inequalities among many others. These utopian visions construct a path towards a preferable future, rather than an all too predictable future where the conflict between capital and labour is settled in much the same way as earlier periods of industrial transformation, which is to say by arriving at a settlement that privileges the interests of corporations over workers and their communities. There remains a good deal of work to articulate how an all-inclusive model of transition will be enacted – and there is limited international consensus as to what considerations should be prioritised. And, as we have argued above, there has been insufficient attention given to the wider issues concerning the practicalities of developing the technologies required to power a low-carbon economy. In the following paragraphs, we interrogate the concept further taking into account the effect different ‘justice’ positions have on the direction of the debate.

A useful place to begin is with John Rawls' notion of ‘justice as fairness’, which starts with the idea of an ‘original position’, whereby the principles of justice are agreed to in an initial situation that is ‘fair’ – a hypothetical situation where principles are chosen behind a ‘veil of ignorance’ so that all are similarly situated and no one is able to design principles that favour their present individual circumstances (Rawls, 1999). Under these conditions, it is assumed that rational people who want to protect their own interests would opt for a system that offers the ‘maximum’ protection and benefit for the greatest number of people and the widest range of predicaments. Utilitarian conceptions of justice generally hold that a society is just when its institutions achieve the greatest amount of good for the greatest amount of people, or the greatest net balance of good summed over the individuals belonging to that society. Rawls reminds us that utilitarianism fails to account for the distinction between persons or groups of persons. In other words, this is a conception of justice that accepts diminished prospects for some simply for the sake of a greater sum of advantages enjoyed by others (Rawls, 1999, p. 13).

For our purposes, this notion of justice as fairness exposes injustices that may be justified in the name of an urgent energy transition. If we take seriously the Kantian idea ‘that people are always to be treated as ends, and never as means only’ (Kant 1786, cited in Rawls, 1973), then how we frame the just transition concept matters a great deal, as we need to understand who bears the burden and shares the benefits of a global energy transition (Sovacool & Dworkin, 2015). In this sense, placing social justice considerations at the heart of the climate debate has an instrumental purpose that can be applied to climate and energy transition policies, as it can help to build and maintain social cohesion during a period of radical social, economic and cultural change. For all the promises contained in this rapidly popularised notion, the actual sourcing of ETMs suggests that in practice the idea of a just transition remains grounded in a utilitarian framework. That is, most just transition plans and programmes fail to account for the broader set of injustices and inequalities inherent to resource extraction.

Advocates for the just transition concept argue that it provides a more inclusive framework that can encompass existing climate, energy and environmental justice communities, gain more public acceptance, and therefore have more impact (Heffron & McCauley, 2018; see also Healy & Barry, 2017; Stevis & Felli, 2015). McCauley and Heffron argue

that in order to achieve this, society must link the distributive and procedural dimensions of justice with a third dimension, namely ‘restorative justice’ (McCauley & Heffron, 2018). In their view, this expanded construct will help to emphasise past, present and future injustices – and the restorations or reparations that are required. The distributional inequalities and impacts associated with the extraction of ETMs highlight the legacies of colonialism and Indigenous dispossession that form part of the global processes of capitalist accumulation and industrial development (Wolf, 1982) that have created the ‘overheating effects’ (Eriksen, 2016) that characterise the Capitalocene. We anticipate a growing discourse around ‘sacrifice zones’ where new and existing extractive projects are justified in terms of global imperatives. These sacrifice zones can be understood in spatial, social and ontological terms. Where extractive projects were previously justified in terms of national-level benefits (that supposedly outweigh local-level harms), it can be expected that some new projects and expansions will be justified in terms of global necessity. As extractive companies contribute to the consensus on transitioning, projects that might otherwise be difficult to justify (in terms of environmental and social costs) may become acceptable. The urgency to transition justifies the costs on the understanding that there is no alternative. In other words, there is a greater risk people will be crushed under the weight of a grand green narrative.

Procedural considerations include the extent to which local and Indigenous land holding communities are engaged in the planning, assessment and negotiation of extracting ETMs, and whether these projects proceed with their free prior and informed consent (FPIC). These considerations equally apply to the closure and rehabilitation of these projects, not least of all because the risks and impacts experienced during operations generally intensify towards the end of the project lifecycle. So far, the mining industry has not demonstrated the capability or the willingness to uphold the principle of FPIC consistently (Kemp & Owen, 2017), which presents a major risk as extractive activities expand into the future.

Finally, while the just transition concept originally emerged with an implied restorative ethic – as labour unions agreed to support the move to cleaner technologies so long as job losses could be restored to their previous levels (Doorey, 2017) – restorative justice has received limited attention in the academic and policy debates surrounding the idea of a just transition. In the shift to a low-carbon economy, there will be a need for restorative solutions for a much wider set of issues and injustices than the loss of jobs in declining industries. There are major questions around harms that have been inflicted in the past and the on-going perpetration of damages against individuals, communities, as well the environment and the climate – from extractive projects that supply ETMs, for example. For these reasons, the conception of justice that drives the just transition movement demands more sustained attention.

7 | CONCLUDING REMARKS: IS IT JUST A TRANSITION?

If the current shift is just a transition towards cleaner energy technologies, without a substantive focus on justice, the social and

environmental consequences of this transition, or the energy cost of extracting ETMs, we might then ask whether this counts as a protective counter-movement against the extremes of extractive capitalism, a corporate counter move in disguise, or whether it counts as something else altogether.

As we noted at the outset, just transition was originally conceived as a kind of counter-movement to protect the rights and interests of frontline workers and communities affected by heavy polluting industries. The idea has merits. It places an unequivocal emphasis on justice. It draws attention to the justice considerations entailed in moving out of fossil fuels and moving into low-carbon energy-systems – which suggest that the idea is better conceptualised in plural terms, as *just transitions* (IHRB, 2020). The idea could be mobilised to strengthen the remedial dimensions of the ‘protect, respect and remedy’ framework that underpins the UN Guiding Principles on Business and Human Rights. Based upon existing uptake, we anticipate use by an expanding set of actors to support reform agendas to alleviate some of the pressures created by globalised neoliberalism. This will likely be a historically specific rather than a universal process, as just transition movements are highly conditioned. We hasten to add that while some actors will refer to the concept as the normative basis for radical reform, there will be others who have very different intentions and who will use the concept to maintain the status quo.

One specific way in which this may occur is through the promotion of a job-centric view of a just transition that maintains a cultural attachment to the paid work ethic, and upholds the dominant social relations of production. This issue has been explored in relation to automation, which is often posited as an enabler for more emancipatory scenarios where the need for labour is reduced or in some cases eliminated altogether, creating opportunities to replace the ‘work-ethic’ with a ‘worthwhile-ethic’ that recognises all forms of work and care (Frayne, 2015; Faucheret & Jourdan, 2017). Here, we simply note a few direct linkages with mining and concurrent contradictions. The mining industry has invested heavily in automation, which is transforming the nature of mining and industrial work. While the industry has been keen to promote this investment as a cleaner, cheaper, safer and more socially responsible form of production, this ‘upside’ narrative hides numerous downsides, including the creation of surplus labour. Moreover, there is little indication that the industry has considered how these technology trends will affect local communities (Keenan et al., 2019), particularly in those regions where Indigenous landowners have entered into land use agreements with mining companies in exchange for employment opportunities and other economic benefits (Holcombe & Kemp, 2019). Here, automation extends the source level injustices we have discussed, rather than liberating mine-affected communities.

The extent to which the rewards from automation will be distributed evenly will depend on a wide range of factors, promising emancipation for some workers and greater hardship in other regions and sectors. In countries where the costs of labour remain low – which roughly maps against the global distribution of ETMs – there will be fewer incentives for mining companies and other sectors to automate.

As such, the rewards and risks from the process of automation will remain unevenly distributed geographically and demographically. The creation of surplus labour and the continued use of cheap labour is likely to reinforce a ‘job-centric’ just transition, where part of the solution to this issue is found in the creation of ‘greener jobs’, rather than imagining ways to decouple income from labour and open up a discussion about the range of forces that shape community well-being. Such forces include rising income inequality, economic insecurity, authoritarianism and corruption and diminished public access to green spaces and other commons. In other words, the mainstream transition discourse remains many times removed from realising the liberating potential of automation, or the hard realities of an energy transition – both of which are interlinked. As we have demonstrated, the future demand for ETMs, and the burdens that this will unleash, eclipses the purported principles contained within mainstream renditions of the concept. In light of this conceptual asymmetry, it will be increasingly important to differentiate between stated rhetorical intentions and actual impact.

We can therefore say that the mainstream discourse surrounding a just transition, especially the ways in which the term relates to the extractives, contains a double bind. The famous 20th-century anthropologist, Gregory Bateson, defined this as a self-refuting kind of communication, such as when you say two incompatible things at once (Bateson, 1972, cited in Erisken 2018, p. 40). Thomas Hyland Eriksen provides an example: you can be favourable to fossil fuels (which provide energy and employment), and you can be determined to halt climate change, but you cannot successfully defend both positions at once. This is the contradiction at the heart of extractive industry discourse. The idea of a just transition appears to provide a pathway out of this particular bind. However, the situation becomes far more complicated when we consider the volume of metals and energy required to support the move to a low-carbon economy. The bind contained in mainstream conceptions of a just transition looks like this: you can support an urgent energy transition, and you can be determined to ensure that the move to a low-carbon economy is ‘just’, but you cannot pursue both positions at once without radically reimagining how resource extraction is conducted or without confronting the internal contradictions of extractive capitalism. To put it another way, this solution platform is incompatible with the problem platform. Read through the lens of the Capitalocene, the current ecological and energy shift are best conceptualised as the latest predicaments in the *longue durée* of the Capitalocene.

In the closing pages of *The Great Transformation*, Polanyi offers a preliminary pathway out of this bind, arguing that industrial society ‘can afford to be both just and free’ (2001, p. 265). His vision brings us back to the question of justice in the current moment of transition, and the policy focus and forms of state action that will be necessary for transformative change. Utilitarian conceptions of justice cannot deliver this vision of society; it is literally impossible. On the other hand, if the idea of a just transition is grounded in a conception of justice as fairness – in terms of the fair distribution of benefits and burdens of climate initiatives – this could support a new paradigm of human freedom and new institutional forms to enable the sort of

broader durable change that Polanyi envisioned. For Polanyi, this pathway is contingent upon two interconnected parts. First, a greater level of state intervention will be required because only states can operate at the scale that is necessary for this type of change. Second, he argued that we must come to terms with the 'reality of life' in a complex society, which implies the need for a change in human consciousness whereby human freedom is no longer defined in terms of being left alone, or individuals exercising their freedom of consciousness autonomous from everyone else. A move in this direction would also deprive neoliberal rhetoric of its core appeal. Rather, freedom can only be realised through a recognition that humans necessarily live in complex interdependence, which demands a kind of 'thick reciprocity' (Block, 2008, pp. 11–12) or 'relational autonomy' (Mackenzie & Stoljar, 2000). A conception of justice as fairness is indispensable for this ambitious goal. Polanyi believed in a deep transformation, not small improvements in the distribution of income and opportunity that leaves the power of wealth holders intact. As we reflect upon the challenges confronting a just process of transition, it is clear that anything less will only result in a slight shift and leave history firmly in the grip of the double movement.

ACKNOWLEDGEMENTS

This work was supported by strategic funds from The University of Queensland, through the Sustainable Minerals Institute's Complex Orebodies cross-cutting program. The authors are grateful to Kathryn Kochan for collecting detailed information from corporate websites and sustainability reports. Thanks are also due to colleagues who commented on early drafts of this article and our three anonymous peer reviewers.

ORCID

Nicholas Bainton  <https://orcid.org/0000-0001-7571-3679>

Deanna Kemp  <https://orcid.org/0000-0002-1435-2694>

Eleonore Lèbre  <https://orcid.org/0000-0002-5159-3446>

John R. Owen  <https://orcid.org/0000-0002-5952-0479>

Greg Marston  <https://orcid.org/0000-0002-0263-140X>

ENDNOTES

- ¹ What we understand as industrial capitalism, or what is nowadays commonly termed 'neoliberal capitalism' (Harvey, 2005), is the product of both forms of movement. This is what Karl Marx meant by dialectical materialism, and what John Kenneth Galbraith had in mind when he formulated his notion of 'countervailing power' based on his observations of mid-20th century American market forces (Galbraith, 1963).
- ² We read this elaboration of 'Schumpeter's gale' as a kind of blind tragedy of the global commons, writ large.
- ³ The term is generally attributed to US trade union leader, war veteran and peace activist, Tony Mazzochi, who argued for a superfund to provide financial support and higher education opportunities to workers who were displaced by the introduction of environmental protection policies. For a genealogy of the term, see Stevis et al. (2019).
- ⁴ It appears that energy companies have been quicker to adopt the language of just transition in public policies. For example, the transnational energy company bp recently amended its human rights policy to 'recognize the importance of a just transition as envisioned by the Paris

Agreement – one which delivers decent work, quality jobs and supports the livelihoods of local communities' (bp, 2020).

⁵ See Anglo American (2018), Anglo American (2019), African Rainbow Minerals (2019) South32 (2019, p. 18).

⁶ For comparison, in 2019, global energy-related greenhouse gas emissions were 33 billion tonnes of CO₂e (IEA, 2020).

REFERENCES

- African Rainbow Minerals. (2019). Climate and Water Supplementary Report 2019. Retrieved from <https://arm.co.za/sustainability/>
- Alston, P. (2020). *The parlous state of poverty eradication: Report of the special rapporteur on extreme poverty and human rights*. Geneva: United Nations.
- Anglo American. (2018). 2018 Interim Results, Thursday 26 July 2018, Conference call transcript. Retrieved from <https://www.angloamerican.com/media/speeches/2018>
- Anglo American. (2019). Interim Results, Thursday 25 July 2019. Retrieved from <https://www.angloamerican.com/media/speeches/2019>
- Azadi, M., Northey, S. A., Ali, S. H., & Edraki, M. (2020). Transparency on greenhouse gas emissions from mining to enable climate change mitigation. *Nature Geoscience*, 13(2), 100–104.
- Bainton, N., & Holcombe, S. (2018). A critical review of the social aspects of mine closure. *Resources Policy*, 59, 468–478.
- Bainton, N., & McDougall, D. (2021). Unequal lives in the Western Pacific. In N. Bainton, D. McDougall, K. Alexeyeff, & J. Cox (Eds.), *Unequal lives: Gender, race and class in the Western Pacific*, (pp. 1–46). Canberra: ANU Press.
- Bainton, N., Owen, J. R., & Kemp, D. (2020). Invisibility and the extractive-pandemic nexus. *The Extractive Industries and Society*, 7(3), 841–843.
- Bainton, N., & Skrzypek, E. (2021). *The absent presence of the state in large-scale resource extraction projects*. Canberra: ANU Press.
- Bainton, N. A., Owen, J. R., & Kemp, D. (2018). Mining, mobility and sustainable development: An introduction. *Sustainable Development*, 26(5), 437–440. <https://doi.org/10.1002/sd.1889>
- Barnosky, A. D., Hadly, E. A., Bascompte, J., Berlow, E. L., Brown, J. H., Fortelius, M., ... Smith, A. B. (2012). Approaching a state shift in Earth's biosphere. *Nature*, 486(7401), 52–58.
- Bebbington, A. (2012). *Social conflict, economic development and extractive industry: Evidence from South America*. London, England: Routledge.
- Bensen, P., & Kirsch, S. (2010). Capitalism and the politics of resignation. *Current Anthropology*, 51(4), 459–486.
- Block, F. (2008). Polanyi's double movement and the reconstruction of critical theory. *Revue Interventions Économiques*, 38, 1–17.
- bp. (2020). Business and human rights policy. Retrieved from <https://www.bp.com/en/global/corporate/sustainability/human-rights/human-rights-policy.html>
- Bridge, G. (2004). Mapping the bonanza: Geographies of mining investment in an era of neoliberal reform. *The Professional Geographer*, 56(3), 406–421.
- Cha, J. M. (2020). A just transition for whom? Politics, contestation, and social identity in the disruption of coal in the Powder River Basin. *Energy Research & Social Science*, 69, 101657. <https://doi.org/10.1016/j.erss.2020.101657>
- Church, C., & Crawford, A. (2018). *Green conflict minerals: The fuels of conflict in the transition to a low-carbon economy*. Manitoba, Canada: International Institute for Sustainable Development.
- Connelly, S. (2007). Mapping sustainable development as a contested concept. *Local Environment*, 12(3), 259–278.
- Doorey, D. J. (2017). Just transitions law: Putting labour law to work on climate change. *Journal of Environmental Law and Practice*, 30(2), 201–239.
- Eriksen, T. H. (2016). *Overheating: An anthropology of accelerated change*. London: Pluto Press.

- Eriksen, T. H. (2018). *Boomtown: Runaway globalisation on the Queensland coast*. London, England: Pluto Press.
- Escobar, A. (2015). Degrowth, postdevelopment, and transitions: A preliminary conversation. *Sustainability Science*, 10(3), 451–462.
- Faucheret, A., & Jourdan, D. (Eds.). (2017). *The promise of total automation*. London, England: Sternberg Press.
- Frayne, D. (2015). *The refusal of work: The theory and practice of resistance to work*. London: Zed Books.
- FFP. (2018). *Fragile States Index*. Washington, DC: The Fund For Peace. Retrieved from <https://fragilestatesindex.org/>.
- Galbraith, J. (1963). *American capitalism: The concept of countervailing power*. Harmondsworth: Penguin.
- Glencore. (2020). *Furthering our commitment to the transition to a low-carbon economy*. Media statement, 20 February 2019. Retrieved from <https://www.glencore.com/media-and-insights/news/Furthering-our-commitment-to-the-transition-to-a-low-carbon-economy>
- Haberl, H., Fischer-Kowalski, M., Krausmann, F., Martinez-Alier, J., & Winiwarter, V. (2011). A socio-metabolic transition towards sustainability? Challenges for another great transformation. *Sustainable Development*, 19, 1–14.
- Harvey, D. (2005). *The new imperialism*. New York, NY: Oxford University Press.
- Healy, N., & Barry, J. (2017). Politicizing energy justice and energy system transitions: Fossil fuel divestment and a “just transition”. *Energy Policy*, 108, 451–459.
- Heffron, R. J., & McCauley, D. (2018). What is the just transition. *Geoforum*, 88, 4–77.
- Holcombe, S., & Kemp, D. (2019). Indigenous peoples and mine automation: An issues paper. *Resources Policy*, 63, 101420.
- Hund, K., La Porta, D., Fabregas, T.P., Laing, T., & Drexhage J. (2020). *Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition*. Washington: The World Bank.
- IEA. (2020). Global CO₂ emissions in 2019: Data release. International Energy Agency. Retrieved from <https://www.iea.org/articles/global-co2-emissions-in-2019>
- IEN. (2020). Indigenous Principles of Just Transition. Indigenous Environment Network. Retrieved from <https://www.ienearth.org/justtransition/>
- IHRB. (2020). *Just Transitions for All: Linking Business, Human Rights, and Climate Action*. East Sussex, UK: Institute for Business and Human Rights. Retrieved from <https://www.ihrb.org/focus-areas/just-transitions/report-just-transitions-for-all>
- IRP (2019). Global resources outlook 2019 - natural Resources for the Future we want. In B. Oberle, S. Bringezu, S. Hatfield-Dodds, S. Hellweg, H. Schandl, J. Clement, ... B. Zhu, (Eds.), *A report of the international resource panel*. Nairobi, Kenya: United Nations Environment Programme.
- IRP (2020). Mineral resource governance in the 21st century - gearing extractive industries towards sustainable development. In E. T. Ayuk, A. M. Pedro, P. Ekins, J. Gatune, B. Milligan, B. Oberle ... A. R. Sanders, (Eds.), *A report of the international resource panel*. Kenya, Nairobi: United Nations Environment Programme.
- Jacka, J. (2015). *Alchemy in the rain forest: Politics, ecology, and resilience in a New Guinea mining area*. Durham: Duke University Press.
- Jackson, T. (2009). *Prosperity without growth: Economics for a finite planet*. London, England: Earthscan.
- Jananoff, S. (2018). Just transitions: A humble approach to global energy futures. *Energy Research & Social Science*, 35, 11–14.
- Jenkins, K. E. H., Sovacool, B. K., Błachowicz, A., & Lauer, A. (2020). Politicising the just transition: Linking global climate policy, nationally determined contributions and targeted research agendas. *Geoforum*, 115, 138–142. <https://doi.org/10.1016/j.geoforum.2020.05.012>
- Kanger, L., & Schot, J. (2019). Deep transitions: Theorizing the long-term patterns of socio-technical change. *Environmental Innovation and Societal Transitions*, 32, 7–21.
- Keenan, J., Kemp, D., & Owen, J. R. (2019). Corporate social responsibility and the social risk of new mining technologies. *Corporate Social Responsibility and Environmental Management*, 26(4), 752–760.
- Kemp, D., & Owen, J. R. (2017). Corporate readiness and the human rights risks of applying FPIC in the global mining industry. *Business and Human Rights Journal*, 2, 163–169.
- Kirsch, S. (2009). Sustainable mining. *Dialectical Anthropology*, 34(1), 87–93.
- Klein, N. (2019). *On fire: The burning case for a green new deal*. Toronto, Canada: Alfred A. Knopf.
- Laclau, E. (1996). *Emancipation(s)*. London, England: Verso.
- Le Billon, P. (2014). *Wars of plunder: Conflicts, profits and the politics of resources*. New York, NY: Oxford University Press.
- Lèbre, É., Owen, J. R., Corder, G. D., Kemp, D., Stringer, M., & Valenta, R. K. (2019). Source risks as constraints to future metal supply. *Environmental Science & Technology*, 53, 10571–10579.
- Lèbre, É., Stringer, M., Svobodova, K., Owen, J. R., Kemp, D., Cote, C., ... Valenta, R. K. (2020). The social and environmental complexities of extracting energy transition metals. *Nature Communications*, 11, 4823.
- Mackenzie, C., & Stoljar, N. (2000). *Relational autonomy: Feminist perspectives on autonomy, agency, and the social self*. New York, NY: Oxford University Press.
- Malm, A. (2016). *Fossil capital: The rise of steam power and the roots of global warming*. London, England: Verso.
- Mayer, A. (2018). A just transition for coal miners? Community identity and support from local policy actors. *Environmental Innovation and Societal Transitions*, 28, 1–13.
- McCauley, D., & Heffron, R. (2018). Just transition: Integrating climate, energy and environmental justice. *Energy Policy*, 119, 1–7.
- Moore, J. W. (Ed.). (2016). *Anthropocene or Capitalocene? Nature, history and the crisis of capitalism*. Oakland, CA: PM Press.
- Moore, J. W. (2017). The Capitalocene, part I: On the nature and origins of our ecological crisis. *The Journal of Peasant Studies*, 44(3), 594–630.
- Moore, J. W. (2018). The Capitalocene part II: Accumulation by appropriation and the centrality of unpaid work/energy. *The Journal of Peasant Studies*, 45(2), 237–279.
- Mudd, G. M. (2010). The environmental sustainability of mining in Australia: Key mega-trends and looming constraints. *Resources Policy*, 35(2), 98–115.
- Newell, P., & Mulvaney, D. (2013). The political economy of the ‘just transition’. *The Geographical Journal*, 179(2), 132–140.
- Norgate, T., & Haque, N. (2010). Energy and greenhouse gas impacts of mining and mineral processing operations. *Journal of Cleaner Production*, 18, 266–274.
- Northey, S. A., Mudd, G. M., & Werner, T. (2018). Unresolved complexity in assessments of mineral resource depletion and availability. *Natural Resources Research*, 27, 241–255.
- Owen, J. R., Kemp, D., Lèbre, É., Svobodova, K., & Pérez Murillo, G. (2020). Catastrophic tailings dam failures and disaster risk disclosure. *International Journal of Disaster Risk Reduction*, 42, 101361.
- Polanyi, K. (1977). *The livelihood of man (edited by H.W. Pearson)*. New York, NY: Academic Press.
- Polanyi, K. (2001[1944]). *The great transformation: The political and economic origins of our time*. Boston: Beacon Press.
- Rawls, J. (1973). Distributive justice. In E. S. Phelps (Ed.), *Economic justice: Selected readings* (pp. 319–362). Harmondsworth, England: Penguin.
- Rawls, J. (1999). *A theory of justice*. Cambridge MA: The Belknap Press of Harvard University Press.
- Rio Tinto. (2018). Our approach to climate change 2018. Retrieved from <https://www.riotinto.com/invest/reports>
- Robbins, B. (2017). *The beneficiary*. Durham: Duke University Press.
- Ross, M. L. (1999). The political economy of the resource curse. *World Politics*, 51(2), 297–322.
- Ruccio, D. (2017). ‘Capitalocene’, Progress in political economy. Retrieved from <https://www.ppesydney.net/capitalocene/>
- S&P Global. (2020). S&P Global Market Intelligence. Thomson Reuters. Retrieved from <https://www.snl.com>
- South32. (2019). Our approach to climate change 2019. Retrieved from <https://www.south32.net/who-we-are/sustainability-approach/climate-change>

- Sovacool, B. K., & Dworkin, M. H. (2015). Energy justice: Conceptual insights and practical applications. *Applied Energy*, 142, 435–444. <https://doi.org/10.1016/j.apenergy.2015.01.002>
- Stavis, D., & Felli, R. (2015). Global labour unions and just transition to a green economy. *International Environmental Agreements: Politics, Law and Economics*, 15(1), 29–43.
- Stavis, D., Morena, E., & Krause, D. (2019). Introduction: The genealogy and contemporary politics of just transitions. In E. Morena, D. Krause, & D. Stavis (Eds.), *Social justice in the shift towards a low-carbon world* (pp. 1–31). London, England: Pluto Press.
- Svobodova, K., Owen, J. R., Harris, J., & Worden, S. (2020). Complexities and contradictions in the global energy transition: A re-evaluation of country-level factors and dependencies. *Applied Energy*, 265(1), 114778.
- UNCCC. (2018). Solidarity and Just Transition: Silesia Declaration. COP24 Katowice 2018. United Nations Climate Change Conference.
- UNFCCC. (2016). Paris Agreement, in UNFCCC COP Report Number 21, Addendum, at 21, U.N. Do. FCCC/CP/2015/10/Add.1.
- Urciuoli, B. (2008). Skills and selves in the new workplace. *American Ethnologist*, 35(2), 211–228.
- Urciuoli, B. (2010). Neoliberal education: Preparing the student for the new workplace. In C. J. Greenhouse (Ed.), *Ethnographies of neoliberalism* (pp. 162–176). Philadelphia: University of Pennsylvania Press.
- Valenta, R., Kemp, D., Owen, J., Corder, G., & Lèbre, É. (2019). Re-thinking complex orebodies: Consequences for the future world supply of copper. *Journal of Cleaner Production*, 220, 816–826.
- Vanderveest, P., & Peluso, N. L. (1995). Territorialization and state power in Thailand. *Theory and Society*, 24(3), 385–426.
- Voyles, T. B. (2015). *Wastelanding: Legacies of uranium mining in Navajo country*. Minneapolis: University of Minnesota Press.
- Wolf, E. (1982). *Europe and the people without history*. Berkeley: University of California Press.
- York, R., & Bell, S. E. (2019). Energy transitions or additions?: Why a transition from fossil fuels requires more than the growth of renewable energy. *Energy Research & Social Science*, 51, 40–43. <https://doi.org/10.1016/j.erss.2019.01.008>

How to cite this article: Bainton N, Kemp D, Lèbre E, Owen JR, Marston G. The energy-extractives nexus and the just transition. *Sustainable Development*. 2021;1–11. <https://doi.org/10.1002/sd.2163>