Book Reviews

Fossil Fuel Subsidy Reform: An International Law Perspective, by Vernon Rive

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Henok Asmelash*

The last two decades have seen a growing movement that calls for fossil fuel subsidy reform. One of the key features of this anti-fossil fuel subsidy movement is its top-down orientation. Much of the spike in attention and pressure to reform fossil fuel subsidies comes from the international level – often in direct contradiction to public protests against fossil fuel subsidy reforms at the national level.¹ Several international initiatives to reform fossil fuel subsidies have emerged particularly after the G20 leaders agreed to phase out inefficient fossil fuel subsidies at their Pittsburgh Summit in 2009. These intergovernmental initiatives depart from the traditional reluctance of governments to address energy issues at the international level. Fossil fuel subsidies and other energy issues were long considered as the sole prerogative of national governments not least because of national security concerns. This consideration makes the intergovernmental nature of the anti-fossil fuel subsidy movement appear incongruous and even more interesting. However, the international origins of the movement and the reasons that make fossil fuel subsidies an appropriate subject for international law have not received adequate attention in the burgeoning literature on fossil fuel subsidy reform.

In *Fossil Fuel Subsidy Reform: An International Law Perspective*, Vernon Rive takes up these and other intriguing issues concerning the international legal and governance framework relevant to fossil fuel subsidy reform. Having traced the origins of the intergovernmental anti-fossil fuel subsidy movement, Rive offers an insightful account of the specific factors and circumstances surrounding the sudden emergence of fossil fuel subsidies as a matter of international law and policy. His observation that although ‘energy subsidies have been on the radar of natural resource, energy and international trade an-

alysts since at least as early as the 1970s, [...] proposals for international oversight and disciplining of fossil fuel subsidies are essentially post-1990s phenomena’² has solid empirical support. In fact, fossil fuel subsidies and their reform made their first ever explicit appearance in international negotiations during the Kyoto Protocol negotiations of the 1990s in which the draft article 2.1(a)(v) of the Protocol listed the ‘progressive phasing out of market imperfections and fiscal incentives that run counter to the objective of the Convention, including, inter alia, subsidies on all fossil fuels’ as one of the priority policies and measures to address climate change.³ The obliteration of the explicit reference to fossil fuel subsidies from the final text of the Protocol represents an early sign of pushback against the anti-fossil fuel subsidy movement at the international level – an area the book could have explored in more detail.

Rive offers three possible justifications for the ‘treatment of fossil fuel subsidies as ‘fair game’ for international negotiation and regulation’⁴. These are the potential trade distortive effects of fossil fuel subsidies, the ‘willing tying of hands’ rationale in which governments undertake international commitments to fend off pressure from domestic interest groups, and the transboundary environmental effects of fossil fuel subsidies that typically stem from the attendant wasteful energy consumption. The combination of these three factors, as Rive thoroughly explains, makes fossil fuel subsidies a legitimate subject for international law.

The international legal and governance framework for fossil fuel subsidy reform is characterized by two key features: fragmentation and informal law

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1 The rise in fuel prices in the aftermath of fossil fuel subsidy reforms often triggers public protests. See Neil McCulloch et al ‘An Exploration of the Association between Fuel Subsidies and Fuel Riots’ (2021) www.researchsquare.com/article/rs-142268/v1.

2 Vernon Rive, *Fossil Fuel Subsidy Reform: An International Law Perspective* (Edward Elgar Publishing 2019) 234.

3 See UNFCCC ‘Completion of a Protocol or Another Legal Instrument: Consolidated Negotiating Text by the Chairman’ FCC/AGBM/1997/7 (13 October 1997).

4 Rive (n 2) 9.

making. Numerous international organizations and intergovernmental forums have joined the movement in one form or another. These range from formal international organizations such as the United Nations Framework Convention on Climate Change (UNFCCC) and the World Trade Organization (WTO) to informal intergovernmental forums and coalitions such as the G20 and the Friends of Fossil Fuel Subsidy Reform (FFFSR). The involvement of these diverse institutions and forums in the movement underlines the crosscutting nature of fossil fuel subsidies and the social, economic and environmental objectives underlying the need for their reform.⁵ The multiplicity of institutions and the resulting fragmentation of the governance framework presents its own challenges and opportunities.⁶ Rive is of the view that the opportunities for collaboration among the multiple institutions and forums working in the area of fossil fuel subsidy reform 'have yet to be fully exploited'.⁷ For example, he laments the failure of the 2018 WTO Trade Policy Reviews of China and the Philippines to take advantage of the fossil fuel subsidy information that emerged from their G20 and APEC voluntary peer review processes in the preceding years.⁸ Despite the missed opportunities, he considers the argument that 'any one international institution has, or should have, exclusive jurisdiction over fossil fuel subsidies' as 'misplaced' and strongly argues that fossil fuel subsidies deserve 'multi-regime' and 'multi-actor' responses.⁹ It is with this spirit that he meticulously maps and analyses each of the fragmented international regimes governing fossil fuel subsidies and their reform in Chapters 4–8. In Chapters 5 and 6, Rive offers a detailed and systematic analysis of the international trade rules rele-

vant to fossil fuel subsidies. These chapters identify the key limitations of the international trade regime in tackling environmentally harmful fossil fuel subsidies and suggests possible ways of aligning the multilateral trade rules with the anti-fossil fuel subsidy movement.

The second salient feature of the international legal framework for fossil fuel subsidy reform is its strong reliance on soft law and flexible governance arrangements. Most intergovernmental fossil fuel subsidy reform commitments remain political and voluntary in nature. Rive pays due attention to these flexible governance regimes in Chapters 7 and 8. While Chapter 7 considers the role of the FFFSR and New Zealand in the intergovernmental anti-fossil fuel subsidy movement, Chapter 8 offers a detailed analysis of the operation and limitations of the voluntary peer review processes of the G20 and APEC.

Joe Biden's election to the US presidency has given a tremendous boost to the intergovernmental movement against fossil fuel subsidies. His apparent strong commitment to tackle climate change by accelerating the energy transition will help recover the momentum undermined by the presidency of Donald Trump and its pro-fossil fuel and anti-environmental rhetoric over the last four years.¹⁰ It is imperative that the developed economies first walk the talk to convince their developing counterparts to follow suit. Rive captures the prevalent hypocrisy in the global anti-fossil fuel subsidy movement in his striking story about New Zealand – the *de facto* leader of the intergovernmental movement against fossil fuel subsidies – winning the 'fossil of the day' award at COP21 in 2015 for 'urging countries to phase out fossil fuel subsidies while maintaining production subsidies on the order of tens of millions'.¹¹ The return of the U.S. leadership in tackling climate change coupled with concrete steps to remove its massive tax-based fossil fuel production subsidies will undoubtedly strengthen the call for a worldwide reform of fossil fuel subsidies in the years ahead. Vernon Rive's book is a timely and invaluable addition to the literature on fossil fuel subsidy reform as we enter into a new chapter in the intergovernmental movement against environmentally harmful fossil fuel subsidies. The book is ideal for anyone interested not only in the international legal framework governing fossil fuel subsidies and their reform but also in the basics of fossil fuel subsidies such as their definition, measurement, and the cases for and against their ex-

5 See Henok Birhanu Asmelash 'Falling Oil Prices and Sustainable Energy Transition: Towards a Multilateral Agreement on Fossil-Fuel Subsidies' in Douglas Arent et al (eds), *The Political Economy of Clean Energy Transitions* (Oxford University Press 2017); Cleo Verkuijl and Harro van Asselt 'Fossil Fuel Subsidy Reform: Interactions between International Cooperative Institutions. The More, the Merrier?' in Fariborz Zelli et al (eds), *Governing the Climate-Energy Nexus* (Cambridge University Press 2020).

6 Rive (n 2) 240–250.

7 *ibid* 242.

8 *ibid*.

9 *ibid* 244–245.

10 See 'Executive Order on Tackling the Climate Crisis at Home and Abroad' (27 January 2021) www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/.

11 Rive (n 2) 14.

istence (which he covered in Chapters 2 and 3 in clear and accessible language).

Climate Change, Disasters, and the Refugee Convention, by Matthew Scott

Cambridge: Cambridge University Press, 2020
184 pp, £27 (paperback)

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In this thought-provoking book, Matthew Scott advocates for a social paradigm approach to disasters and refugee status determination (RSD) instead of the prevailing hazards paradigm.¹ By relying on the social paradigm, he argues, it may be possible to extend protection of the Geneva Convention on Refugees² to those affected by disasters and climate change. He proceeds to show why RSD should take account of the wider social context within which disasters unfold, rather than being guided by outdated notions of human agency. He proposes a recalibrated definition of a “refugee” with discrimination as the central organizing principle. Being persecuted, he argues, should be understood as *a condition of existence*, and not as isolated acts of persecution.³

Adverse consequences of climate change such as sea level rise and severe weather events are making many places uninhabitable. Yet, those who seek protection in another country for climate-related reasons, currently lack legal protection. The “dominant view” which resonates with prevailing jurisprudence is that the Refugees Convention is not applicable to them as disaster-related harm is quite distinct from ‘persecution’,⁴ because the required human agency

is missing. Moreover, natural disasters and climate change do not discriminate, and discrimination is an integral feature of the refugee definition.⁵ Scott challenges this dominant view. Increasingly, people are fleeing climate change-related consequences and courts are being called upon to address this issue within existing legal frameworks. Granted, when the Refugee Convention was adopted in the aftermath of World War II climate change was not a factor. Much of the existing literature identifies a new category of refugees called ‘climate refugees’⁶ but Scott neither adopts this terminology nor engages with scholarship on it⁷ as he argues that the Refugee Convention can, in fact, cover that situation if a wider framing is adopted.

While most scholars believe that climate-related disasters have nothing to do with violence and the state, an alternative view is emerging about the role of human agency in relation to natural disasters because their impact can be either minimized or exacerbated by social policies and institutions. When disasters are understood from a social perspective, the Refugee Convention becomes more relevant to the predicament of displaced persons.⁸ Thus, a person could establish eligibility for refugee status ‘when, owing to a discriminatory state response to a situation of disaster, a person is exposed to serious harm’⁹ which Scott proceeds to show falls within his recalibrated definition of ‘being persecuted.’ The social and historical context in which environmental displacement takes place must be understood in determining refugee status.

In Chapter 2 Scott points out that most definitions of ‘disaster’ are based on the hazard paradigm and focus on an event, rather than more complex process-

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1 Matthew Scott, *Climate Change, Disasters, and the Refugee Convention* (Cambridge 2020) 87.

2 Convention Relating to the Status of Refugees (1951) and its Protocol (1967) www.unhcr.org/en-us/1951-refugee-convention.html.

3 Scott (n 1) 155, emphasis added.

4 *ibid* 2.

5 *ibid* 4.

6 This is not a legal term. It simply describes those who are displaced across borders by adverse consequences relating to climate change.

7 This topic has attracted considerable scholarly attention. See Simon Behrman and Avidan Kent (eds) *‘Climate Refugees’: Beyond the Legal Impasse?* (2018, Routledge); and *id*, *Facilitating the Resettlement and Rights of Climate Refugees* (Routledge 2018); Jane McAdam, *Climate Change, Forced Migration and International Law* (Oxford University Press 2012); *id* (ed), *Climate Change and Displacement: Multidisciplinary Perspectives* (Hart Publishing 2010); Sumudu Atapattu, ‘Climate Change and Displacement: Protecting ‘Climate Refugees’ within a Framework of Justice and Human Rights’ (2020) 11 *Journal of Human Rights and the Environment* 86–113; Foresight, ‘Migration and Global Environmental Change: Future Challenges and Opportunities’ (2011), Final Project Report, The Government Office for Science, London; Benoit Mayer and Francois Crepeau (eds), *Research Handbook on Climate Change, Migration and the Law* (Edward Elgar 2017); Dimitra Manou et al (eds), *Climate Change, Migration and Human Rights: Law and Policy Perspectives*, (Routledge 2017).

8 Scott (n 1) 6.

9 *ibid* 7.

es and systemic discrimination that make certain populations more vulnerable to disasters. The social paradigm, on the other hand, sees disasters ‘as a consequence of the interaction of natural hazards and social vulnerability.’¹⁰ Thus, human agency is inherent in *all* disasters. It recognizes that certain individuals may be more vulnerable than others because of pre-existing patterns of discrimination. Moreover, it understands disasters as *a process*, historically contingent and changing over time and provides a more comprehensive understanding: ‘People already on the margins of society as a result of discrimination are made even more vulnerable through a crisis.’¹¹ Additionally, the compounding effect of intersecting forms of discrimination requires attention.

Chapter 3 analyzes each criterion of the refugee definition – well-founded fear, being persecuted, Convention reasons, motivation, standard of causation and internal relocation – through a myriad of case law. The book expressly adopts a predicament approach to interpret the relationship between being persecuted and the Convention grounds. Scott argues that two central cases – *AF (Kiribati)* and *AC (Tuvalu)* – while based on a human rights-based approach cast the temporal scope too narrowly and the personal

scope too widely.¹² Even though in *AF (Kiribati)*, the New Zealand Court of Appeals recognized the threat posed by climate change, it believed that the situation should not be addressed under the Refugee Convention.¹³ Scott believes that the Court failed to appreciate the social context but a more balanced conclusion was reached by the Supreme Court when it noted that the courts’ decisions did not mean that ‘environmental degradation resulting from climate change or other natural disasters could never create a pathway into the Refugee Convention or protection person jurisdiction.’¹⁴

Chapter 5 is devoted to a discussion of the temporal scope of ‘being persecuted’. The event paradigm¹⁵ that dominates jurisprudence is reinforced by the idea that the well-founded fear element requires a risk assessment. However, there is support for a predicament approach claiming that the overall predicament of the claimant in a wider temporal frame should transcend the event paradigm based on isolated events.¹⁶

Scott turns to the element of discrimination in Chapter 6¹⁷ and argues that the predicament approach recognizes discrimination as integral to the notion of being persecuted. On that basis, and connecting the wider temporal frame of structural violence as discrimination in Chapter 5, Scott advances a recalibrated human rights-based definition of ‘being persecuted’: a condition of existence where discrimination is a contributory cause of a serious denial of human rights signifying a failure of state protection.

In the final chapter Scott applies his recalibrated definition to natural disasters and climate change. He utilizes a three-step test¹⁸ to determine who a refugee is: (a) Is the person being persecuted¹⁹ for a Convention reason?²⁰ (b) If yes, has the claimant established the ‘well-founded’ standard of proof? If yes, (c) is internal relocation an option? If no, then the claimant is a refugee. In the context of disasters, the risk of being exposed to violations of human rights due to foreseeable future disasters must also be considered.

In the final analysis Scott contends, ‘when individual risk factors, including vulnerability arising from past exposure to natural disasters combined with marginal social position owing to discrimination, and other factors are considered against an overall risk outlook, it becomes possible to consider the risk of being exposed to future disaster-related harm when determining a claim for refugee status.’²¹ Thus,

10 *ibid* 15.

11 *ibid* 23, quoting the annual World Disasters Report of the IFRC.

12 *ibid* 87.

13 *ibid* 83.

14 *ibid* 84.

15 Scott uses the term ‘event paradigm’ to distinguish it from the predicament approach to show that persecution does not result from a single act which narrows the temporal scope. This is similar to the hazard paradigm in the sense that it too focuses on a single incident which does not take the wider social context into consideration. The social paradigm and the predicament approach are related as many prevailing conditions and factors can contribute to the victim’s predicament. However, sometimes the use of these different terms is unclear and it would have been useful to the reader if the different terminology is better explained in the book.

16 *ibid* 108.

17 *ibid* 112.

18 Scott accepts that this three-prong test is applicable to *any* refugee claim, not just disasters and climate change, *ibid* 132.

19 With regard to disasters and climate change, this would be a recalibrated definition that adopts the predicament approach based on the social paradigm with discrimination as the central focus.

20 Here Scott draws an important distinction: While the ICCPR requires to establish the ‘imminence standard’ as a criterion of admissibility, refugee law asks the question whether there is a real chance that the claimant will be exposed to a serious denial of human rights if sent back.

21 Scott (n 1) 141.

when climate change leads to droughts (or floods), the likelihood of people being exposed to food insecurity is high due to conflicts over resources or if access to resources is restricted. Individuals who face discrimination in everyday life will likely be more exposed and vulnerable than those who are not.

I highly recommend this book to academics, practitioners and students working on climate change, disasters and refugees. It is innovative, thought-provoking and forward-looking and grapples with an emerging question – what kind of legal protection should be accorded to those who are fleeing disasters? While I agree with the overall premise that we need to take the social context and systemic discrimination into account when determining refugee status in relation to climate-induced disasters, I highlight some questions I have below.

First, it is not clear whether the book encompasses both natural disasters *and* climate change or whether it refers to climate-induced disasters. While the author proposes a definition of ‘natural’ disasters,²² it still refers to ‘*natural* hazard events or processes’ and does not refer to climate change. ‘Climate-induced disasters’ is a better term to describe severe weather events triggered by climate change.²³

Second, and related to the first point, while the author distinguishes between disasters induced by climate change and natural hazards, the use of the word *natural* in the context of climate change is misleading. There is scientific consensus that climate change increases the intensity and frequency of severe (or extreme) weather events.²⁴

Third, it is not clear whether, in addition to systemic discrimination, there should be individual discrimination in order to establish persecution. Taken as a whole the answer seems to be in the affirmative, which raises another challenge with regard to climate-induced displacement – the sheer numbers. Given that the numbers are likely to be in the millions particularly when potential claimants from small island states are added, the question arises whether a case-by-case deliberation of refugee status is feasible.

The final comment relates to the UN Human Rights Committee decision in *Teitiota v. New Zealand*.²⁵ While the book would have been in print when the decision was delivered, I wonder whether it would have influenced the focus of the book. Perhaps not, as the author seeks to bring potential claimants affected by climate-induced disasters with-

in the Refugee framework by adopting a social paradigm approach. However, the *Teitiota* decision shows a possible path forward for potential victims of climate change to seek protection under human rights law by invoking the *non-refoulement* principle, rather than via the more difficult route under the Refugee framework.

Effective Global Carbon Markets: Network Emissions Trading Using Disruptive Technology by Justin Macinante

Edward Elgar, 2020

259 pp, £85 (Hardback)

Felicity Deane*

In the opening pages of *Effective Global Carbon Markets*, Justin Macinante begins with a critical observation about the challenges experienced globally in an age of a warming climate. Climate change is not just an environmental concern, but an economic and financial issue that must form part of the mainstream political economy debate. Thus, the operation of carbon markets should be part of the ‘core business for financial regulators and financial supervisory bodies’.¹ This begins the discussion of emissions markets and the ability to network (rather than link the markets) using distributed ledger technology (such as blockchain).²

In consideration of distributed ledger technology (DLT), it is worth noting the vast body of literature

22 *ibid* 21.

23 See the Nansen Initiative which refers to ‘disaster displacement’, Global Consultation Conference Report (2015) www.nanseninitiative.org/global-consultations/.

24 See IPCC ‘A Report of Working Group I of the Intergovernmental Panel on Climate Change: Summary for Policy Makers’ (2007) www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf.

25 Human Rights Committee ‘Views Adopted by the Committee under Article 5 (4) of the Optional Protocol, Concerning Communication No. 2728/2016’ CCPR/C/127/D/2728/2016 (7 January 2020).

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1 Justin Macinante, *Effective Global Carbon Markets: Network Emissions Trading Using Disruptive Technology* (Edward Elgar, 2020) 3.

2 There are a plethora of resources explaining blockchain technology. See for example Don Tapscott and Alex Tapscott, *Blockchain Revolution* (Random House, 2016).

that examines the use and impacts of the software. In many instances, there is a discourse that provides some hype to the technology, seemingly giving it superpowers beyond that which it is capable.³ Alternatively, there is an almost equal volume of critical literature, again looking beyond the neutrality of the software, and suggesting that its invention has furthered the goals associated with neo-liberalism, promoting digital capitalism and maintaining inequalities in the economic world.⁴ Quite rightly, the competing discourse does not form part of the analysis of *Effective Global Carbon Markets*, where distributed ledger technology is seen as a tool that can promote connection for an essential global policy, which is currently suffering from disjointed and competing interest concerns.

The main purpose of *Effective Global Carbon Markets* is to propose the design and operation of a market to mitigate GHG emissions and achieve the collective mitigation goal of the Paris Agreement. The author seeks to treat emissions trading as if it were a financial market, and spends a great deal of the volume on the use of distributed ledger technology as a tool to support the reduction of emissions through market based instruments. Macinante achieves this over five parts incorporating ten chapters. Following the introductory chapter and background information, the second part of the book considers carbon markets from three different perspectives, being the compartmentalisation, the nature of carbon markets and the units and finally a comparison chapter about diversity and connections. Although the author does not aim to analyse the effectiveness of emissions trading as an instrument, nor to compare this tool with other measures to achieve GHG emissions reductions, the failure of the promise of international emissions trading (IET) implemented under the Kyoto Protocol, is examined in the first and second part of the book.

The second part of the book also examines the carbon market through the lens of fragmentation asso-

ciated with international law. Drawing on the work of van Asselt,⁵ amongst others the author suggests that the failure of IET is rather the result of compartmentalisation of the mechanism itself within the climate change regime, rather than being a part of the interconnected whole of global economic policy. To connect rather than compartmentalise, the author suggests may have led to the development of 'beneficial synergies' and enabled the parties to the climate regime to better achieve the mitigation of greenhouse gas emissions and limit global warming to well below two degrees. The remedy for this, the author posits is to ensure the market is designed to operate as a global financial market, including through the engagement of the private sector within it.

Effective Global Carbon Markets makes an argument for the connection of carbon markets in particular in part two of the book, in particular in chapter 5. In doing so, the author notes that there is a growing trend, since the Paris Agreement, for the introduction of carbon pricing as a national policy goal. However, the variation in the pricing measures both in pricing substance and in mechanism form means that the mitigation goals of the Paris Agreement are unlikely to be achieved without better international collaboration. The author proposes that differences should first be overcome through mitigation valuation, a form of compromise that would entail the a 'form of acceptance of the parameters by which a jurisdiction's mitigation actions are valued'. To explain, the mitigation value parameters would apply to all jurisdictions that agree to participate in the collaborative carbon market. This is one of the core concepts contributed by this volume and is central to the argument for networking of carbon markets rather than linking.

The suggestion for networking rather than linking commences in part two of the book. These two strategies are inherently different. Linking necessitates market system alignment and compatibility whereas networking supports both an appreciation and acceptance of differences between systems, alleviating the need for compatibility between markets. In this respect, Macinante suggests that the collaborative carbon market is to be achieved through networking rather than linking because linking has limitations associated with the need for bilateral negotiations, compatibility and limitation of sovereignty. In contrast the networking concept (finding support from the World Bank) has three distinct elements.⁶

3 Melanie Swan, *Blockchain: Blueprint for a New Economy* (O'Reilly Books, 2015).

4 Robert Herian, 'Blockchain as an Ethics of Neoliberal Political Economy' in *Regulating Blockchain: Critical Perspectives in Law and Technology* (Routledge, 2019) 124.

5 Harro van Asselt, Francesco Sindico and Michael Mehling, 'Global Climate Change and the Fragmentation of International Law' (2008) 30 *Law & Policy* 4, 423.

6 See, <<http://www.worldbank.org/en/topic/climatechange/brief/globally-networked-carbon-markets>> accessed 15 April 2021.

First, a mechanism to measure mitigation value of mitigation outcomes, second an international carbon asset reserve and third an international settlement platform. Indeed, those differences can be made compatible through parameters of mitigation valuation.

In part three, Macinante then turns to consider the role of distributed ledger technology in facilitating a networked carbon market. The author posits that through this technology, inter-jurisdictional trade in carbon markets will align with the technological developments of financial markets more broadly. The author notes that the literature provides that this technology will improve financial transactions in many respects across global financial markets, including through immutability and transparency (which are of course promoted as being benefits of distributed ledger technology and blockchain in general). As noted, ‘immutability is probably the most important characteristic that DLT brings, and virtually every description of blockchain or DLT refers to it.’⁷

Regarding the technical details of his proposal, Macinante suggests that the use of smart contracts to enable transactions is superior to a standard database through the elimination of a need for a trusted central counterparty. The removal of this as a necessity will both reduce the time and cost for carrying out transactions (although it is worth noting at the time of writing that there are questions about the scalability of certain DLTs). The model Macinante proposes differs from the Bitcoin blockchain network in that the consensus mechanism of the theoretical networked carbon market will be permissioned rather than permissionless. This suggestion will have both advantages and disadvantages where permissioned blockchain will be moderately less secure than a permissionless one, but at the same time it will provide advantages correlated with its confidentiality.⁸

Part four of *Effective Global Carbon Markets* is thorough and detailed, with a discussion of the market governance in Chapter 8 and an identification of the legal issues associated with a networked market in Chapter 9. Both chapters draw on practical examples and theoretical literature in order to provide a comprehensive analysis of the proposal. The conclusions drawn in the final chapter of the book identify challenges that remain specifically the convergence of climate change law, financial market regulation and the legal requirements associated with the use of DLT in the context of carbon markets.

In conclusion *Effective Global Carbon Markets* recognises many times throughout its chapters that limiting global warming to between 1.5 and 2°C will require that carbon markets and climate change mitigation can be a tool to ensure a meaningful connection between the Paris Agreement mitigation goals and economic decisions on a global level. Importantly the author notes that private sector engagement is essential for success. The final substantive paragraphs of the book note that the subject matter is both broad and technical. *Effective Global Carbon Markets* has transgressed the matters proposed, demonstrating the proficiency of the author throughout.

As parties to the Paris Agreement work towards net zero emissions targets, it is well recognised that innovation will be needed on a momentous scale. This will include innovation in national policies to support voluntary cooperation as articulated in Article 6 of the Paris Agreement. It follows that the timing of this book comes at a crucial time in terms of the convergence of technology and climate change in support of this much needed cooperation. Of course, the mitigation of climate change through the reduction of emissions is a policy goal that increases in importance with each passing year. Following the negotiation of the Paris Agreement in 2015, the goal to stabilise temperature increases to between 1.5 and 2°C globally began as an aspiration, that has since seemed fanciful due to the failure of major emitters to participate in this important global agreement. At the time of writing, there is some hope that the objectives of the Paris Agreement will no longer be flouted in the name of politics and domestic economic interests, and instead the urgency and recognition of the need to act is finally appearing on national and international agendas. Certainly, DLT technology could potentially support connection and cooperation of parties through the shared platform it promotes,⁹ and with this carbon markets can provide one of the important pieces in the patchwork of policy tools available in support of the Paris Agreement GHG mitigation goals.

⁷ (n 1) 114.

⁸ Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* 9.

⁹ Lachlan Robb, Felicity Deane and Warwick Powell, ‘Panoptic Blockchain Ecosystems: An Exploratory Case Study of the Beef Supply Chain’ (2020) 46 *Monash University Law Review* 2, 67.